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AGRICULTURE

No. 1269

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POST HARVEST CROP PROCESSING

SUGAR INDUSTRY PLANS, GOALS FOR 1981 REVIEWED

Moscow SAKHARNAYA PROMYSHLENNOST' in Russian No 1, Jan 81 pp 2-6

[Article: "Successful Fulfillment of the Plan for the First Year of the Eleventh Five-Year Plan"]

[Text] During the Fourth Session of the Tenth Convocation of the USSR Supreme Soviet on 22-23 October 1980, laws were passed concerning the state plan for the economic and social development of the USSR and the state budget of the USSR for 1981 -- the first year of the Eleventh Five-Year Plan. The draft plans and the budget were discussed and approved mainly during the October (1980) Plenum of the Central Committee of the CPSU, which was held on the eve of the opening of the session.

In the speech delivered during the mentioned plenum by the General Secretary of the CC CPSU, Comrade Leonid Il'ich Brezhnev, a thorough analysis was provided of the status of our economy and measures were outlined for further developing the national economy and raising the standard of living of the people.

The plenum gave its complete approval for the positions and arguments set forth in the speech by Comrade L.I. Brezhnev and it resolved to have them serve as the foundation for all work by the party, soviet and economic organs and the professional trade union and komsomol organizations, in connection with fulfilling and over-fulfilling the 1981 plan and making more complete use of the intensive factors for economic development, in the interest of raising the welfare of the people.

During the Plenum of the CC CPSU and the Session of the USSR Supreme Soviet, emphasis was placed upon the fact that past years have confirmed the correctness of the economic strategy developed during the 24th and 25th party congresses. The country's economic and defense potential has increased considerably. A new and forward step has been taken in developing the entire national economy and in the solving of great and complicated tasks. The Tenth Five-Year Plan will occupy a worthy place in the history of heroic works by our Soviet people, as they confidently advance along the path leading to communism.

During the final year of the Tenth Five-Year Plan, the volume of industrial production increased by 4 percent above the figure for 1979. More than three fourths of the increase in output achieved during 1980 was the result of improved labor productivity.

For the Tenth Five-Year Plan on the whole, 717 more billion rubles worth of products were produced in industry than during the Ninth Five-Year Plan. More than 1,200 new enterprises were placed in operation and the capabilities of existing facilities were expanded considerably.

During the 1976-1980 period, mechanization, land reclamation and the use of chemical processes were employed on an extensive scale in agriculture. Despite extremely unfavorable weather conditions in a number of regions throughout the country in 1977, 1979 and 1980, the average annual volume of agricultural output increased by nine percent above the figure for the previous five-year period. During the Tenth Five-Year Plan, the average annual grain harvest exceeded 200 million tons for the very first time. The five-year plan for harvesting cotton was fulfilled.

Important measures aimed at raising the standard of living of the Soviet people were carried out during the Tenth Five-Year Plan. Workers in the Soviet Union take pride in the fact that the program proclaimed by the Communist Party for intensifying the economic potential of our homeland and for further raising the standard of living of the people is embodied in specific actions being carried out. Our country has entered the 1980's with a powerful economic and scientific-technical potential and highly skilled personnel at its disposal.

In response to concern displayed by the party, a national socialist competition for making worthy preparations for the 26th Congress of the Leninist Party has been launched on an extensive scale in our country.

The initiators of this competition in the food industry include worker collectives, engineering-technical workers and office workers at the Moscow Order of Lenin Food Combine, Tbilisi Sugar Plant, Cherkassy Sugar Refining Plant imeni M.V. Frunze, Odessa Order of the "Badge of Honor" Experimental Canning Plant imeni V.I. Lenin and other enterprises.

The collectives of many enterprises of the food industry fulfilled ahead of schedule their plan and socialist obligations for 1980, their tasks for the Tenth Five-Year Plan on the whole and also their raised socialist obligations undertaken in honor of the 26th CPSU Congress, with regard to increasing the production, expanding the assortment and improving the quality of products and making rational use of their fuel-energy, raw material, material and labor resources.

The collectives at the Tbilisi, Korenovsk, Zbarazh, Kupyansk, Kotovsk, Narkevichskiy, Ostrozhskiy, Meleuz and a number of other sugar plants are included among those enterprises of the sugar industry which fulfilled ahead-of-schedule their tasks for the Tenth Five-Year Plan in connection with gross output volume, sales of products and overall production of sugar (from sugar beets and raw materials). The collective at the Cherkassy Sugar Refining Plant imeni M.V. Frunze was the first (16 October 1980) to report ahead-of-schedule fulfillment of their five-year task for refined sugar production and for the volume of products produced and sold. In honor of the 26th CPSU Congress, the collective at this plant has vowed to produce 100,000 rubles worth of products over and above the plan during January and February of 1981.

The plan and budget for the first year of the Eleventh Five-Year Plan signify a new and important step being taken towards further developing the country's productive forces.

The state plan for economic and social development of the USSR for 1981 calls for an increase of 3.4 percent, compared to 1980, in national income to be used for consumption and savings, production of industrial goods -- an increase of 4.1 percent and in real per capita income -- an increase of 2.9 percent.

The plans call for labor productivity to be raised 3.6 percent, with approximately 90 percent of the increase in industrial output to be obtained based upon this indicator.

In the plan for the current year, special attention is being given to developing the agroindustrial food complex, increasing the production of consumer goods, retaining the level achieved in housing construction and solving other social tasks.

In the speech delivered by Comrade L.I. Brezhnev before the October (1980) Plenum of the CC CPSU, it was noted that the Politburo of the CC CPSU had handed down a decision regarding the preparation of a food program, which brings together those questions concerned with the development of agriculture and the industrial, procurement, storage, transport and agricultural product processing branches which service it and also questions associated with development of the food industry and trade in food products. This agroindustrial food complex will be planned, financed and administered as a single entity, thus ensuring high final results.

Just as in the past, the party and state are devoting a great amount of attention to developing the fuel-energy complex, chemistry and machine-building and also to the further development of the logistical base for agriculture and capital construction.

In conformity with the state plan for the economic and social development of the USSR, sugar beet procurements from the 1981 harvest should reach a total volume of 91.16 million tons, or 6 million more tons than the maximum procurements during the years of the Tenth Five-Year Plan (1976).

The sugar industry workers, particularly the leaders and specialists of sugar plants, must furnish a maximum amount of assistance to the country's beet growers in carrying out this important national economic task. Serious attention must be given at the present time to supplying each farm with beet seed for regionalized varieties on a timely basis and to furnishing assistance in preparing the cadres of beet growers and the equipment for the field operations and in cultivating the beet fields. During the repair period, it will be necessary to prepare the beet receiving stations in a fine manner for the acceptance and reliable storage of the raw materials from the new harvest. Special attention must be given to completely carrying out all of the measures called for in the joint obligations of the beet growers, the sugar plant workers and transport workers, all of whom are competing and following the example set by the Yampol' workers as they strive to obtain high final results -- obtain a maximum amount of sugar from each hectare of beet field and from each ton of raw material procured.

It bears mentioning that during the years of the Tenth Five-Year Plan a considerable amount of work was carried out in connection with the technical equipping of the beet receiving stations. The fleet of tractor loaders and clamp forming machines was renovated and increased in size, a large number of motor vehicle scales of a

raised load capability were installed and all of the plants were provided with semi-automatic lines for determining the sugar content of the beets being received.

At the same time, the tasks approved for the Tenth Five-Year Plan for the construction of concrete platforms equipped with units for storing beets under forced ventilation were not fulfilled for the branch as a whole or for many of the union republic minpishcheproms. For example, only 1.34 million square meters of hard surface platform space were built in 1980, with only 460,000 square meters of this space having units for the forced ventilation of beets.

Against a task calling for the building of hard surface platforms and units for the forced ventilation of beets at the L'vov Association of 140,000 square meters, Khar'kov -- 75, Sumy -- 60, Khmel'nitskiy -- 60, Lipetsk -- 38 and Tambov -- 38,000 square meters, the sugar plants at these associations never even commenced carrying out these tasks.

This is explained not only by a shortage of material resources but also by the failure of individual leaders to properly evaluate the importance of employing forced ventilation for the storage of beets containing large quantities of damaged roots.

During 1981, concrete platforms equipped with units for the forced ventilation of beets must be built in considerably greater numbers than in 1980 and other work associated with additional technical equipping of the beet receiving stations must also be carried out.

The workers attached to sugar plants and to sugar industry administrations and associations must apply themselves in an urgent manner to the work of preparing the beet receiving stations for accepting the sugar beets of the new harvest and they must carry out all measures called for in the 1981 tasks in a timely manner, so as to ensure more complete retention of the technological qualities of the raw materials procured, reduce losses during their storage and processing and produce as much sugar as possible from these materials.

The state plan for 1981 calls for 9.05 million tons of sugar to be produced from beets, including 8.82 million tons during the last 6 months of the year. A total of 2.7 million tons of refined sugar must be produced, including 770,000 tons in packaged form, that is, somewhat more than was produced last year.

The tense task for the production of granulated sugar from beets during the second half of 1981 can be carried out on the basis of fine work being performed at each plant and increased use being made of the available production capabilities. This requires that all workers in the branch display a great amount of energy and organizational ability and employ a creative approach in solving those problems associated with high quality preparation of the enterprises for processing the sugar beets of the new harvest.

During the repair period, a great amount of attention must be given to carrying out those measures aimed at raising production efficiency, reducing losses, increasing output and improving the quality of the sugar being produced.

An important task during 1981 will be that of successfully producing granulated sugar from raw cane sugar during the inter-seasonal period. A predominant number of sugar plants possess adequate experience in this regard. Thus it will be necessary, from the very beginning of the year, to ensure a high sugar output, reduce labor expenditures and production costs for the goods being produced and raise backward plants, on the basis of these indicators, to the level of the leading plants.

Just as in past years, the priority tasks of the sugar industry workers are: improving the use of production capabilities at active and modernized sugar plants, reducing labor expenditures for the processing of beets and outdoor work and achieving maximum economies in the use of fuel, electric power and production and repair materials.

Within the industry there are many leading sugar plant collectives which are performing with fine indicators for the utilization of production capabilities, labor expenditures for the processing of beets and for achieving economies in fuel consumption (Tbilisskiy, imeni Lenin in Belgorodskaya Oblast, Meleuzovskiy, 2d imeni Petrovskiy, Gonorovskiy, Kel'menetskiy, Salivonkovskiy, Brodetskiy, Kotovskiy, Nizovskiy, Korenovskiy, Dinskoy, Gnidavskiy, Zasel'skiy, Kupyanskiy, Uspenskiy, Novokubanskiy, Babinskiy, Brailovskiy, Yares'kovskiy, Skidel'skiy, Panevezhskiy, Karabaltinskiy and others).

However, there are still many plants which are using less than 85 percent of their production capability and which have labor expenditures and fuel consumption rates that are 50 percent and 30-40 percent greater respectively than those at leading enterprises.

The workers at sugar plants and production and industrial enterprises should study thoroughly and utilize the experience of leading enterprises, such that there will be no backward sugar plants in the branch during the new five-year plan.

During the Tenth Five-Year Plan, owing to the technical re-equipping of enterprises of the starch-syrup industry, the capabilities to produce dry starch, glucose and syrup increased and the capability of the enterprises to process potatoes rose by 150,000 tons annually.

During the past five-year plan, the Verkhnedneprovsk Combine and the Bendery and Shyaulyay starch-syrup plants coped successfully with their production plans. Improvements took place in the production-technical indicators of the corn processing enterprises.

At the same time, the national economic requirement for starch products is not being satisfied fully. Such enterprises as the Beslan and Yaroslavl' starch-syrup combines are not making sufficient use of their available potential for increasing output through the improved use of potential and raw materials.

Compared to last year, the plan for 1981 called for a 6 percent increase in the production of starch syrup and 9 percent in the production of granulated sugar. The plans also called for an expansion in the capability to produce starch products, including the placing in operation of the new Yefremov Corn Processing Combine, with its capability for producing 31,000 tons of glucose annually.

The tasks of workers assigned to the starch-syrup industry include making maximum use of the capabilities of those enterprises engaged in the processing of corn and also introducing into operations the experience of leading enterprises with regard to the efficient use of raw materials.

In solving the tasks confronting the sugar and starch-syrup industry, a special role must be played by the workers attached to scientific-research and planning institutes. The effectiveness in introducing scientific achievements into operations and the periods of time required by new and modernized enterprises for mastering the planned indicators are dependent upon the completeness, technical level of development, schedules and quality of the plans carried out.

The program adopted during the Fourth Session of the USSR Supreme Soviet for the economic and social development of the country during 1981 represents a new and important step taken in communist construction, in further intensifying the country's production potential and in raising the standard of living of our Soviet people.

Each day draws us closer to an important event in the life of the party and country -- the 26th CPSU Congress.

"Ahead of us" stated Comrade L.I. Brezhnev during the October (1980) Plenum of the CC CPSU, "lies a great amount of work. During the 1980's, we must complete the work of converting the economy over to intensified development and raising sharply the productivity and quality of labor. An indispensable condition for production successes continues to be that of raising the level of administrative work and instilling a business-like attitude, responsibility and initiative in the personnel."

These instructions by Comrade L.I. Brezhnev fully apply to all workers in the sugar and starch-syrup industry. They obligate the leaders at all levels of administration to correct existing shortcomings in the work, to raise the level of management over subordinate enterprises and to search for more efficient methods for development and new opportunities for achieving progress more rapidly.

By way of displaying their unanimous support and approval of the decisions handed down during the October (1980) Plenum of the CC CPSU and the regular session of the USSR Supreme Soviet, the workers in the sugar and starch-syrup industry are devoting all of their effort, knowledge and experience towards searching for additional reserves for successfully fulfilling the plan for the first year of the Eleventh Five-Year Plan.

7026
CSO: 1824

UDC 631.22

SPECIALIZED BEEF PRODUCTION COMPLEXES DESCRIBED

Moscow SEL'SKOYE KHOZYAYSTVO ROSSII in Russian No 1, Jan 81 pp 51-52

[Article by G. Bel'kov, deputy director of the All-Union Scientific Research Institute of Beef Cattle Husbandry: "What Should a Beef Production Complex Consist Of?"]

[Text] In beef cattle husbandry, all expenses for the maintenance of cows with calves, heifers and bulls apply to the production costs for weight increase in the young stock. Computations have shown that on farms where the annual maintenance of a meat cow costs less than 180 rubles, the production cost for a quintal of weight increase fluctuates from 95 to 100 rubles and for expenses in excess of 220 rubles it increases to 125-160 rubles.

Amortization deductions for facilities occupy a considerable proportion of the production cost structure for weight increase. Thus a reduction in specific capital investments for the construction of livestock husbandry installations represents an indispensable condition for lowering the production cost for beef and raising the efficiency of the branch.

A large number of the beef cattle complexes were built in accordance with plan No. 801-159, which calls for the animals to be maintained in substantial cow barns made out of reinforced concrete and having sturdy walls and ceilings. This adds to the cost of construction and inhibits the creation of a favorable microclimate. The cost for one cattle billet at such complexes ranges from 1,040 to 1,400 rubles.

It is known that beef strains of cattle are distinguished by a raised resistance against low temperatures. Thus they can be fed and watered in exercise-feeding yards. The facilities also serve as an area where the animals can rest and be sheltered from inclement weather. Thus the capacity of the building increases by roughly 40 percent. But such maintenance requires appropriate equipment for the exercise-feeding yards. From the standpoint of sanitation, their area, in the absence of a solid surface, must provide 25-30 square meters per head -- almost two times more than the planning norm. The exercise yards are equipped with snow and wind protection fencing.

Labor productivity at some existing complexes has remained at the former level, despite the fact that they have been supplied with more items of power engineering equipment. The workload per individual worker is 55-95 head. This is clearly

inadequate for beef cattle husbandry. And this occurred owing to the fact that, coincidental with converting over to an industrial basis, the production technology and organization of labor did not undergo any changes, but rather they remained the same as on small farms: just as in the past, the cattle are divided into herds and groups and the facilities are partitioned off into longitudinal and transverse sections and this inhibits highly productive utilization of the equipment. Instead of the brigade system, use is made of the herd system for servicing the animals. Moreover, the feed problem has yet to be solved at many complexes.

Meanwhile, at fattening sites in Orenburgskaya Oblast and particularly at an experimental farm of VNIIMS [All-Union Scientific Research Institute of Beef Cattle Husbandry], valuable experience has been accumulated in use of the brigade-team system of labor organization, which can be employed successfully at beef complexes and farms. Based upon use of this system and the results of numerous studies, our institute developed a plan for a complex for 1,200 cows with calves. And at the experimental farm of VNIIMS, this plan was employed for constructing an industrial complex having a complete turnover of the herd. Large groups of cattle are being maintained in unheated facilities of the light-duty type. The feeding and watering are carried out in exercise-feeding yards, the area of which provides 24 square meters per head. They are equipped with wind screens 3 meters in height. Snow-drift fencing has been installed on the side of the prevailing winds. Thorough levelling off of the territory and an arrangement of hills serve to ensure the run-off of sewage waters and at the same time they reduce contamination of the cattle enclosures during inclement weather. With the exception of a 3-meter strip alongside the feeding troughs, the exercise yards and facilities lack a hard surface.

All of the brood stock are divided into four groups in terms of their physiological condition: the first of these groups is accommodated in the maternity department (1) (see diagram). The animals, upon arrival at the maternity department 8-10 days prior to calving, are placed in individual stalls measuring 2X3 meters. The facility is equipped with farmyard manure conveyers and automatic water bowls.

Eight to ten days following calving, the cow and its calf are transferred to a second building (2), where a section is partitioned off for the special feeding of calves. The young stock are left free to enter this section at any time. Feeding troughs for coarse and succulent feed are installed in this section. The calves obtain concentrates from self-feeders installed in this same area. With the aid of an ESK-10 distributor, granules prepared according to a special recipe (in addition to concentrates, they also include grass meal, macro and micro-elements and vitamins) are poured into the self-feeders.

In the front portion of the cow barn there is an artificial insemination station and stalls for the maintenance of cows during the intervals between two inseminations. Subsequently, the cows with their calves are transferred to a third facility (3), equipped in a similar manner with the exception of the artificial insemination station.

At 7-8 months of age, the calves are separated and the cows transferred to a fourth building (4), from which point they are again sent to the maternity department. Following weaning, the young stock are raised here in facilities of the light-duty type (5), or they are transferred to other farms.

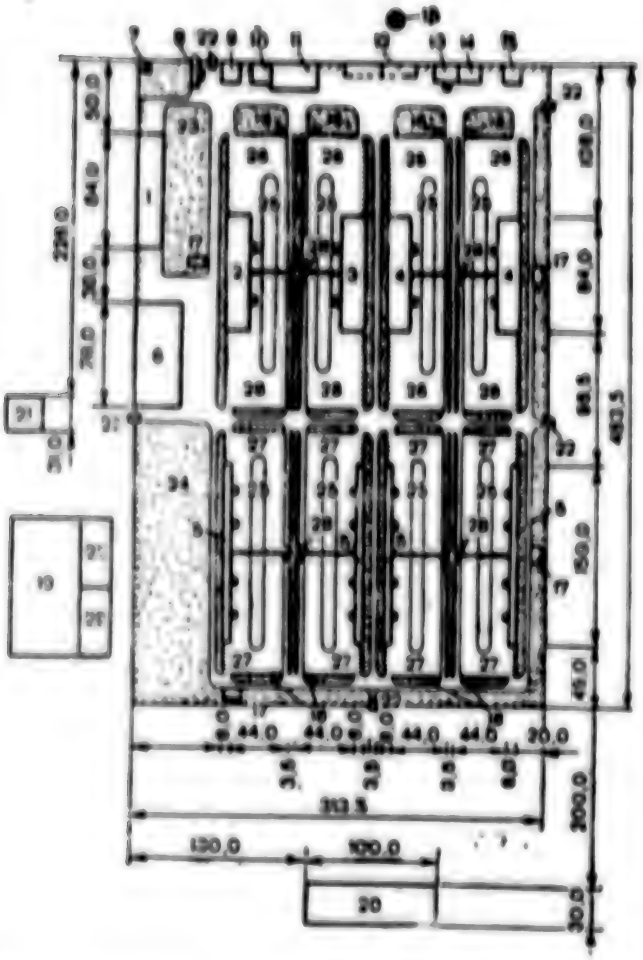

Diagram of Complex for 1,200 Beef Cattle With Calves

Key:

1. Maternity department for 100 stalls
2. Cow barn for 300 head, for maintenance of calves from 15 days to 2 months
3. Cow barn for 300 head, for maintenance of calves from 2 to 8 months
4. Cow barn for 300 head, for dry cows
5. Building for 350 head of young stock
6. Multi-purpose card
7. Transformer sub-station
8. Motor vehicle scale
9. Brigade building for 25 individuals
10. Feed preparation shop
11. Grain storehouse for 1,000 tons
12. Building for three tractors and a machine shed
13. Hospital for 15 cows
14. Isolation ward for 15 animals
15. Slaughtering-sanitary station
16. Liquid manure tank for 15 cubic meters
17. Fire reservoir for 100 cubic meters
18. Water tower
19. Area for coarse feed
20. Area for farmyard manure
21. Settling pond for 250 cubic meters
22. Dezo-barrier
23. Resting zone
24. Reserve territory
25. Hills for resting of animals
26. Exercise yard for cows
27. Exercise yard for calves
28. AGK-4A automatic watering bowl
29. Silage trenches

The flow line-circular system of herd reproduction simplifies accounting procedures, the carrying out of artificial insemination operations and prophylactic work aimed at eliminating barrenness. The work of zooveterinary specialists and the equipment employed for the artificial insemination of cows are now concentrated in the second group (reproduction department).

All of the animals are serviced by a brigade consisting of seven herdsmen-machine operators. In the feed preparation shop here, the forage is shredded, mixed and enriched with premixes and thereafter it is dispensed using a KTU-10K distributor. The manure is removed by a bulldozer; it is raked into piles and periodically transported to the manure pits. AGK-4 automatic watering bowls are employed for watering the cattle. The water is heated in the winter. When such a technology is employed for feeding and maintenance, the average daily weight increases for the calves range from 750-830 grams. Young bulls achieve a live weight of 420-450 kilograms by the time they are 14-15 months of age.

Specific capital investments for one cattle billet amount to 705 rubles. The period for reimbursement -- 2.6 years.

At the complex of the institute's experimental farm, cows with calves are maintained on straw bedding; a deep layer is provided in the autumn and each day it is renewed at the rate of 2-3 kilograms of straw per head. If the bedding is formed properly, the biothermal processes in it will furnish an adequate amount of heat. For bedding purposes, 10-12 quintals of straw are required annually for each cow with a calf. It is not always possible to lay straw away in such quantities, especially during dry years. In such instances, it is recommended that the cow barns be equipped with boxes arranged along the walls and between the manure passages. The latter should be made using hard surfaces. In order to prevent destruction of the passages by the bulldozer blade, rails or wooden joists should be pounded down into the concrete. If the boxes are made out of metal, then they should consist of sections, with 8-10 units in each section.

Many years of experience with the box method of livestock maintenance at the experimental farm of VNIIMS have shown that the expenses for bedding straw are reduced to a minimum, being used mainly for the calves. During the wintering period, a woolen cover does not become contaminated and this is of extreme importance from the standpoint of normal temperature control during the cold period of the year. Transport expenses for bringing up straw and carting away manure are reduced.

The cost of one box with a clay floor is 20-22 rubles. This constitutes 3-3.5 percent of all specific capital investments for a cattle billet.

The planning proposals of VNIIMS were approved by the Scientific-Technical Council of the USSR Ministry of Agriculture and recommended for standard planning. During the past few years, standard plans have been created for reproduction breeding farms for 600, 800 and 1,200 beef cattle for the southern Urals and Siberia. In addition, complexes have been developed for 600, 800 and 1,200 head, with a complete turnover of the herd, a complex for raising beef strains of heifers and a station for evaluating young bulls. Jointly with Giproniisel'khoz [All-Union Planning and Scientific Research Institute for the Planning of Standard and Experimental

Agricultural Production Centers and Establishments for Storing and Processing of Grain] and VIZh [All-Union Scientific Research Institute of Livestock Breeding], standard planning has been completed for fattening sites for 1,000, 3,000 and 5,000 head of cattle.

The institute is presently preparing a planning proposal for the construction of a fattening complex for 5,000 head of young horned cattle stock, having a combination maintenance technology. It is intended for use in the southern Urals, Siberia and in other zones. The plans call for the young stock to be raised during the initial period in closed facilities, thereafter in adaptable facilities and during the final period -- at fattening sites.

The need for creating such a complex is based upon the fact that even in zones of intensive development of beef cattle husbandry, the proportion of beef strains of young stock being assigned to fattening regimes does not exceed 25-30 percent. The remaining percent consists of dairy cows and mixed strains. Our observations have shown that these latter animals, when undergoing fattening at the sites, adapt very slowly to severe weather conditions and as a rule their weight increases are lower than those for beef strains. Such young stock should ideally be prepared for fattening at the sites by being raised in the facilities. Moreover, this will make it possible, to a certain degree, to smooth out the seasonal fluctuations in the arrival of young stock for fattening.

In conclusion, I would like to emphasize the fact that new planning developments are being introduced into operations extremely slowly, at times requiring up to 8 years. Closer contacts are required between the scientific research institute and the planning institutes.

7026
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UDC 631(571.1)+631(571.5)

SIBERIA'S POTENTIAL IN SOVIET CROP PROGRAM DISCUSSED

Moscow SEL'SKOYE KHOZYAYSTVO ROSSII in Russian No 1, Jan 81 pp 17-20

[Article by R. Kondrat'yev, corresponding member of VASKhNIL, director of agricultural Sciences]

[Text] Enormous significance is given to development of the productive forces of Siberia in the country's economics. In his speech at the October (1980) Plenary Session of the CPSU Central Committee, Comrade L. I. Brezhnev emphasized that the Politburo of the CPSU Central Committee supported the proposal to develop a large-scale program of forest development of the oil and gas industry of Western Siberia. This program should become the most important link of the 11th and 12th Five-Year Plans. The intensive rates of development of the natural resources of Siberia are advancing to the forefront with all acuity problems of the most rapid development of agriculture in order to more fully meet the needs of the populace of the eastern region of the Russian Federation for food products.

The agricultural production of Siberia increased by eight percent per 100 hectares of agricultural lands during the 10th Five-Year Plan compared to the Ninth. Labor productivity on the kolkhozes and sovkhozes of Western Siberia increased by 17 percent and that of Eastern Siberia increased by 9 percent. This level exceeds the corresponding average indicator by 28 percent in Western Siberia and by 14 percent in Eastern Siberia compared to the RSFSR. The kolkhozes and sovkhozes increased sales of products to the state compared to the previous five-year plan.

Domestic production of surplus grain now exceeds the recommended norms of consumption. And even so an increase of it compared to the previous level remains a key problem of Siberian agriculture. The main thing in this direction is to increase yields to 17.7 quintals per hectare in Western Siberia and to 16 quintals per hectare in Eastern Siberia during the next few years. The importance of this solution is intensified if one takes into account that the growth rates of production slowed down during the past few years in some regions. Specifically, this is true of Kemerovskaya and Tyumenskaya Oblasts, Krasnoyarskiy Kray and the Tuvinskava ASSR.

This situation in the grain economy cannot be explained only by the complex weather conditions which developed during the past few years. Under evaluation of the role of clean fallow lands and insufficient attention to increasing the overall efficiency of agriculture are reflected here.

Good and stable indicators by years are being achieved on those kolkhozes and sovkhozes where agricultural efficiency is high, the technique of grain crop cultivation is scientifically based and is being fulfilled technically accurately and on time, despite the unfavorable conditions. Thus, a total of 23-30 quintals of grain per hectare were harvested during the 10th Five-Year Plan on the experimental production farm Novoural'skoye of the Siberian Scientific Research Institute of Agriculture (the steppe zone of Omskaya Oblast), on sovkhoz Pervomayskiy, Novosibirskaya Oblast (the forest-steppe zone) and on sovkhoz Nazarovskiy, Krasnoyarskiy Kray (forest-steppe zone). And this is due to the high agricultural efficiency.

According to data of agrometeorologists of the Western Siberian Regional Scientific Research Hydrometeorological Institute, the potential capabilities of the Siberian climate are quite high. They permit production of 25-30 quintals of grain per hectare in the steppe zone and 45-50 quintals per hectare in the forest-steppe and taiga zones.

An important role in the overall system of measures for increasing the efficiency of each hectare of grain planting belongs to improving the distribution and structure of grain production, increasing the level of specialization and concentration of cultivation of individual crops by zones. Production of fodder crops--barley and oats--for intrafarm and commercial purposes must be increased in the forest-steppe and taiga regions.

With regard to scientifically based norms of product consumption, the ratio of food and fodder grain in gross production should comprise 1:2.2 in Western Siberia and 1:3.8 in Eastern Siberia during the new five-year plan and it should comprise 1:5.8 and 1:5.5, respectively, in 1990 compared to the actual ratio of 2.3:1 and 1.8:1.

Production of food grain can be concentrated in the steppe regions. Plantings of varieties of strong high-protein wheat should occupy 3.5-4.5 million hectares here, while plantings of durum wheat should comprise 0.4-0.5 million hectares. Plantings of winter rye should be increased twofold and brought up to 600,000-650,000 hectares in the forest-steppe and taiga regions. Introduction of short-stalk rye into production will permit significant facilitation of crop harvesting, will reduce the deadlines, will increase early fall plowing and will implement the agrotechnical measures for wheat control during the fall season.

The Siberian Scientific Research Institute of Plant Culture and Selection has developed a winter-resistant low-growing variety of rye Korotkostebel'naya 69, which is undergoing state and production variety testing. It produces high yields. The straw is 90-110 centimeters long. A short-stalk variety of winter rye of Bashkir selection--Chulpan--is being regionalized in many regions of the taiga and subtaiga zones. Moreover, rye in crop rotation performs the role of "cleaner" of weeds in the fields.

Clear specialization, which provides high level of technology and mechanization of cultivation, also requires concentration of plantings of the main groats cultures. Plantings of winter rye, buckwheat and peas by reducing the areas under spring wheat are being expanded with ordering of distribution and specialization. The total planted area of buckwheat will be 180,000-190,000 hectares in the future (the average annual harvest of the grain is 210,000-230,000 tons), while the planted area of millet will be 75,000-80,000 hectares.

Throughout Siberia as a whole, the entire area under grain crops will be reduced by 500,000 hectares by 1985. This reduction is related to the need to develop fallow-grain crop rotations with short rotation in the main grain-producing rayons of the region. Scientific data indicate that crop rotations with clean fallow produce the highest yield of grain per hectare in the dry steppe and forest-steppe regions.

A total of 55-60 percent of plowed land may be allocated to grain crops in the main grain-growing regions, mainly in the steppe and forest-steppe zones, 15-20 percent may be allocated to clean fallow in the steppe zone and 13-16 percent may be allocated in the forest-steppe zone.

The effectiveness of clean fallow with a simultaneous increase of the total efficiency of agriculture confirms the operating experience of many farms of Omskaya Oblast. During the Eighth Five-Year Plan, the specific weight of fallow lands under plow comprised 9.6 percent, the yield of grain crops comprised 10.1 quintals per hectare and the figure was 11.3 percent at 12.9 quintals during the Ninth Five-Year Plan. During three years of the 10th Five-Year Plan, the area of clean fallow increased to an average of 12.8 percent and the yield increased to 13.4 quintals. During these years the planted area of grain crops was reduced by 10 percent and the gross harvests of grain increased by 24 percent. In 1979, 13.5 percent of plowed lands was clean fallow and the yield was the highest--approximately 18 quintals per hectare, while the figures were 14.6 percent and 17.3 quintals, respectively, in the very unfavorable 1980.

Clean fallow lands now occupy 9 percent of plowed land in Siberia. The fraction of fallow is especially low in Altayskiy and Krasnoyarskiy Krays and Novosibirskaya and Kemerovskaya Oblasts. According to data of the Siberian Department of VASKhNIL [All-Union Academy of Agricultural Sciences imeni V. I. Lenin], the optimum area under clean fallow should comprise 15 percent.

An important reserve for increasing grain production is total assimilation of the soil-protection system of agriculture. Approximately 12 million hectares of lands in Siberia are subjected to one degree or another to water and wind erosion. However, soil protection treatment of the soil throughout the region as a whole is being used only on half the fields subject to erosion. It is being introduced especially poorly in Eastern Siberia. The experience of the arid zones of Western Siberia indicates an undoubted advantage of the given technique over the traditional technique. Planting grain crops according to flat-cut fallow using combination units produces a 15-30 percent higher yield than by plowshare fallow, while the increase is 1.5-2-fold during severely dry years. Moreover, expenditures on production of a quintal of grain are reduced by 20-30 percent.

Extensive introduction of a complex of antierosion measures must be achieved during the next 2 years. In the meantime, introduction of a soil-protective system of agriculture is being held back mainly by a shortage of the appropriate equipment: flat choppers, cultivators, seed drills and chisel harrows.

The potential of the Siberian fields is total dependence on organic and mineral fertilizers. There is a real opportunity on the kolkhozes and sovkhozes to apply up to four tons of organic fertilizers per hectare of plowed land if the total accumulated manure (90-95 million tons annually) and preparation of peat-manure

composts are taken into account. Many leading farms (sovkhoz Pervomayskiy, kolkhoz imeni Kuybyshev, Tatarskiy Rayon, Novosibirskaya Oblast) are already applying at these rates. But it is no less important to apply more mineral fertilizers to all grain crops. One takes into account in this case that superphosphate must be applied at the rate of 30-35 kilograms of dry matter per hectare of plowed land in regions of high wheat concentration. A total of 35-45 kilograms of phosphorus and 60 kilograms each of nitrogen and potassium should be applied per hectare of plowed land in the forest-steppe zone in regions where fodder grain are produced. The total need for mineral fertilizers to support a yield of grain crops of 18-20 quintals per hectare, according to data of Sibniikhim [Siberian Scientific Research Institute of Chemistry], comprises 4.5 million tons of active matter throughout Siberia as a whole, including 1.7 million tons of nitrogen, 1.16 million tons of phosphorus and 1.17 million tons of potassium fertilizers.

When this amount of fertilizers is applied, an increase of nitrogen uptake from the soil by 10 percent is provided and the optimum ratio to phosphorus and potassium is achieved and a progressive increase of soil fertility is reached.

The high saturation of crop rotations with grain crops, widespread use of flat-cutting cultivation and the short vegetation period force one to approach weed control with great care, the crop losses from which may reach 15-20 percent by the end of the rotation period. This means that along with agrotechnical measures, chemical means of plant protection must be used more extensively. The optimum volume of chemical treatment of grain crops against weeds is 40-50 percent of their planted area. Bringing chemical treatment up to this level will make it possible to produce an additional 1-1.5 quintals of grain from each hectare treated with herbicides. Only 25 percent of grain plantings are now treated with chemicals.

Yield can be increased appreciably and grain quality can be approved only on the basis of intensive type varieties. Moreover, it is very important for Siberia that the variety correspond to the conditions of each specific zone, each region and each farm throughout the vegetation period. An advantage is given to spring wheat, which occupies 70 percent of the total area of spring grain crops in Western Siberia and 50 percent in Eastern Siberia. Barley and oats are widespread, while legume crops are planted least of all, which supports an improvement of the structure of planted areas, slows down solution of the problem of plant protein and deprives cereal grains of a good precursor.

There are six selection centers in Siberia. Scientists have achieved appreciable success during the past few years. A total of 48 varieties of different crops has been developed and regionalized during the 10th Five-Year Plan and 86 varieties have been turned over for state strain testing. More than 25 varieties of grain crops have been regionalized. Among them are varieties of spring wheat Novosibirskaya 67, Omskaya, Shadrinskaya, Sayanskaya 55 and Niva, the maximum yield of which is 45-50 quintals. However, distinguished by high yield and good adaptability to unfavorable weather conditions, they are insufficiently resistant to diseases and pests.

Rassvet barley, the potential yield of which is more than 50 quintals, Tayezhnik oats (more than 50 quintals) and Belozernyy oats (up to 60 quintals) and Omskoye 5 millet (more than 30 quintals) are also among regionalized varieties. The periods of introducing new varieties into production must be reduced sharply. The problem

is to have sufficient seed for planting on all farms of the distribution area of a given variety during the second-third year of regionalization.

Today's problem is to convert seed production to an industrial basis. We feel that a transition stage in this is specialization of seed production in all krays, oblasts and autonomous republics, which should be developed in three forms: intrafarm--development of special seed-producing divisions and brigades on large farms where there are large grain areas, intrarayon specialization based on interfarm cooperation--1-3 of the best kolkhozes and sovkhozes specialize in varietal seed production, which provide all farms of the region with seed. This form is feasible in regions where farms with small planting areas predominate, and intraoblast or interrayon cooperation is recommended where there are zones and regions in which the climatic conditions are unfavorable for seed formation and seed production is unstable.

It has been proved that planting only conditioned seeds of the best regionalized varieties increases yield by 2-3 quintals per hectare. It is recommended that clean fallow lands be allocated to seed plantings in arid zones and that a strip of perennial grasses or fields followed by legume crops be allocated in the subtaiga and taiga zones. All seed sections of grain crops should be supplied with phosphorus and nitrogen fertilizers. The quality and yield of seeds are increased sharply with increased rates of phosphorus application compared to nitrogen. A high yield of seeds of classes 1 and 2 can be achieved in arid zones by distributing the seed plantings on irrigated fields fertilized with phosphorus and nitrogen minerals at increased rates.

An increase of seed quality can be achieved by treating the plantings with TUR preparation during late planting deadlines and during cool and wet weather in spring and summer when grain forming and ripening are shifted to the second half of August and September. The straw has been shortened by 15-20 centimeters, the plants do not lodge, the seeds ripen better and harvesting proceeds with minimum losses when using a retardant.

The procedure of senication (forced aging of a plant), developed by the Siberian Department of the USSR Academy of Sciences, which accelerates ripening, reduces the moisture content of the grain and straw and increases seed quality, has become widespread during the past few years in Siberia. Senication can also be carried out on late-ripening plantings of grain crops for food and fodder designation. For example, ripening of grain crops by 5-10 days was accelerated on an area of 200,000 hectares due to senication in Omskaya Oblast and crop losses during harvesting were thus reduced.

What should one say about potato and vegetable production? The number of them in the food balance has increased during the past few years. The need of the populace for potatoes is now being fully met by local production. An average of 250-350 kilograms per capita annually is now being produced, which comprises 122 percent of the recommended norms. Part of the potatoes is exported beyond the region. However, no more than half the gross production now goes to the kolkhozes and sovkhozes. By the end of the 11th Five-Year Plan, areas must be expanded and the yield of this crop must be increased in the public sector no less than 1.5-fold. The specific weight of potatoes in the total area of plowed lands must be increased to 15-20 percent to do this. On farms where potato growing is the main sector,

areas under potatoes may be brought up to 400-600 hectares and potato growing may be allocated among specialized brigades and divisions.

With regard to vegetables, consumption of them per capita due to local production comprises approximately 70 percent. Moreover, the main mass of this product is delivered fresh during August-October.

Methods of increasing the yield of potatoes and vegetables include not only an increase in the level of agrotechnics, but also intensification of work to develop intensive type varieties adapted to unfavorable weather conditions, resistant to diseases, early-ripening varieties and those designed for long storage and mechanized harvesting. The Western Siberian Vegetable-Potato Experimental Selection Station--a unique specialized scientific institution--is now operating in Siberia and the Far East. This is woefully inadequate.

The potential of Siberian lands cannot be considered without efficient use of plowed lands for fodder crops and without increasing the fodder base in general so that it completely corresponds to the level of development of animal husbandry planned for the future.

The kolkhozes and sovkhozes of Siberia sold 4 percent more meat, 9 percent more milk and 2.3 times more eggs during the 10th Five-Year Plan compared to the Ninth Five-Year Plan. The head of horned cattle did not change appreciably compared to 1976, but the number of swine increased by 46.5 percent, the number of sheep and goats increased by 2 percent and the number of poultry increased by 75.5 percent. According to calculations of the scientific institutions of the Siberian Department of VASKhNIL, production in the public sector must be increased by 33.2 and 23.6 percent, respectively, to increase the needs of the populace for milk and veal by 1985, while the density of cattle per head must be increased from 5.5 to 7.5-8 per 100 hectares of agricultural lands, while the average annual milk production must be increased from 2,300-2,350 to 3,400-3,500 kilograms per cow in the future to completely meet local needs and to export dairy products beyond the region.

Of course, this problem cannot be solved without intensive and stable cattle production. The kolkhozes and sovkhozes are now consuming approximately 27 quintals of fodder units per head annually instead of 33-40 quintals. To make up the deficit and to come closer to the zootechnical norms with regard to the productivity of animals, fodder production must be increased by 35-40 percent to the cattle actually fed by 1985.

Intensification of fodder production presumes an increase in the yield of fodder crops grown on plowed land, from which more than three-fourths of fodder is now harvested. Natural hayfields and pastures remain a large reserve, but they require reclamation. One must conscientiously take on improvement of the structure of planted areas with the calculation of increasing the specific weight of green-fodder and legume crops. For example, 16 percent of plowed lands is allocated to these crops in Western Siberia. Also, the specific weight of perennial and annual grasses is unjustifiably high. If one-third of them is replaced by grain, legume and grain-fodder crops in crop rotations with clean fallow and corn, the efficiency of using the land can be increased sharply and an additional 2.5-3 million tons of feed grain and an amount of protein which will be equal to the deficit of concentrates can be achieved.

The following situation has now developed in some oblasts: crop-rotation areas of plowed land were reduced on reserve fields with cultivation of perennial grasses, as a result of which the fraction of grain crops in rotations increased. This forces one to follow grain crops with grain crops, which significantly reduces their yield.

Despite the large areas of planted grasses, the specific weight of such perennial legume crops as alfalfa, clover, sainfoin and sweetclover is low (20-30 percent) in the fodder wedge. Areas of fodder millet, sudan grass and vetch are being slowly expanded.

The balance of rations should be sharply improved in protein content. Throughout the region as a whole, there is 80-85 grams of digestible protein instead of 100-115 grams per feed unit. To produce protein-balanced feeds, there should be no less than 10-15 percent of peas and vetch in the plantings and 1.5-2 quintals of legume or cereal hay should be prepared per ton of corn silage.

The yields of irrigated grasses are increasing sharply. Two crops of legume-cereal grass mixtures per year can be produced by irrigation under conditions of the Siberian steppe and forest-steppe and grass stands can be cut several times.

An important source of fodder production are the natural lands which comprise half of the agricultural areas of Siberia. They will solve the fodder problem to a significant degree. For example, in Western Siberia alone fundamental improvement can be accomplished on five million hectares, which will permit a 1.5-2-fold increase in the harvest of hay and green silage.

Floodplain meadows, the area of which is approximately three million hectares, yield a significant quantity of fodder with low capital investments. If floodplain lands having reclaimed meadows and plantings of fodder crops under plow are developed, 4.7-6.3 million tons of fodder units of various types of fodder can be produced. This quantity will make it possible to provide assimilation of 400,000-600,000 head of horned cattle during the first stage.

The areas of irrigated meadows can be expanded by catchwork irrigation. There are 1.5 million hectares alone for this type of irrigation in Western Siberia.

And what about solonetzic fodder lands? For example, the Siberian Scientific Research Institute of Fodder Crops has developed a system for fundamental improvement of solonetzic meadows and pastures and has introduced it on an area of more than 35,000 hectares in Chanovskiy Rayon, Novosibirskaya Oblast. As a result the harvest of hay was increased almost threefold--from 3.5 to 9.8 quintals per hectare.

Seed production of grasses must be fundamentally improved and selection of fodder crops must be intensified. For example, alfalfa is being restored slowly. Despite the appearance of good varieties of it (Tayezhnaya, Tulunskaya, Oranzhevaya and Biyskaya), the old varieties, regionalized tens of years ago, are more widespread. And all this is due to the fact that the originators and experimental farms of the scientific institutions are not providing accelerated reproduction of varieties, while the specialized grass seed farms are not fulfilling the production plans and sales of seed.

The potential of the Siberian lands is enormous. Our agricultural workers, relying on the advances of science and leading practice, are striving to realize it during the 11th Five-Year Plan.

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POTENTIAL FOR AGRICULTURAL USE OF LAND IN CENTRAL ASIA REVIEWED

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[Article by A. Ye. Mal'tsev, Council for the Coordination of Scientific Activities of the Academies of Science of the Union Republics of the USSR Academy of Science: "The Agricultural Utilization of Land Resources in Central Asia"]

[Text] At the present time the republics of Central Asia are faced with the goals of increasing the production of all agricultural products, the achievement of which will depend greatly on the efficient utilization of land resources.

The territory of Central Asia is divided into plains and mountains. Agricultural production in these regions differs considerably. In the plains the basis of production is irrigated farming of the oasis type. Sowing areas are located primarily on alluvial and foothill plains. The production of industrial, grain and feed crops is concentrated here. The plains are also the largest livestock-raising base in the country. Here about 90 percent of total union production of cotton and karakul, 30 percent of beef and 20 percent of wool is achieved.

In mountainous rayons the basis for agricultural production is dry-land farming and livestock raising. At an elevation of 500-1000 meters irrigated farming is gradually replaced by dry-land farming. Dry-land farming produces grain and feed crops primarily and free lands are utilized as spring and summer pastures. At higher elevations we have the mountainous livestock-raising region where highly productive summer pastures are located.

As far as the availability of land that can be used for agriculture in concerned, this region is one of the richest in the country. Of a total area of 127.7 million hectares about 90 million are utilized by agricultural enterprises and farms. According to the data of the USSR TsSU [Central Statistical Administration], the area used chiefly for agricultural purposes is 70.5 million hectares (Table 1) (5).

Nevertheless, most of the land here is utilized for pastures, where pasture livestock-raising has been developed. Actual farming lands (plowland) occupy about 6 percent of the area. Here cotton farming, grain production, feed production and other branches of agriculture have been developed.

Because of the great variety of climate and topography in Central Asia the soils are very varied.

Table 1

Total Area of Agricultural Lands in 1978, Millions of Hectares

Republic	Total land area	Land area in use	Economically useful land in use	Including	
				Total area of plowland	Irrigated
Uzbek SSR	44.8	32.9	26.2	3.9	3.304
Kirghiz SSR	19.8	16.0	10.1	1.3	0.941
Tadzhik SSR	14.3	9.4	4.2	0.8	0.602
Turkman SSR	48.8	31.6	30.0	0.9	0.892
Central Asia	127.7	89.9	70.5	6.9	5.739

Based on the materials from the council of the study of production strength in USSR Gosplan and from Central Asian scientific-research institutions the soil resources of the Central Asian republics can be divided into the following. Of the total territory of 127.7 million hectares, 72.1 million hectares are desert plains soils (57 percent of the total area), 15.1 million hectares are desert-steppe foothill soils (12 percent of the total area) and 32.4 million hectares are mountainous rayon soils (25 percent of the total area). The rest of the area is occupied by glaciers, fresh water pools formed by melting snow and bodies of water (4).

The characteristics of soils in desert plains include a low humus content, an insignificant soil level, a significant accumulation of gypsum in the lower part of the soil profile, salinization and alkalinity and a poor aeration of soil-forming rocks. Here sandy desert soils are widespread.

On elevated plains and in the foothills of Central Asia grey-brown soils are common. The humus content in them is 0.3-0.7 percent; nitrogen content--0.04-0.07 percent. They can be found in many rayons of Ustyurt, Kzyl-Kum and Karakum.

On alluvial plains large areas are occupied by variously saline takyr soils. They are common in the Amudar'inskiy, Tedzhenskiy and Murgabskiy oases as well as on the plains of Syrdar'ye.

On flat plains made up of clay or loam there is a formation of takyr soil that represent semi-hydromorphic desert soils.

In regions with surplus moisture hydromorphic soils are formed. These include meadow, meadow-bog and bog soils as well as solonchak. They are formed when ground water is nearby and they are usually found along river valleys. Meadow soils are formed where ground water is 1-2 meters deep, and bogs--where ground water is up to 1 meter deep. Hydromorphic soils have various degrees of chloride and sulphate salinization.

Gray desert soils are most commonly developed in the foothill regions of Central Asia that extend in a strip from Ashkhabad to Alma-Ata, separating sandy deserts and plains from mountains. The elevation at which gray desert soils are found varies from 200-400 to 1,200-1,600 meters above sea level. The profile of gray desert soils as compared to desert soils is more developed and differentiated. The humus content is 1-3.5 percent (light, regular or dark gray desert soils).

Brown soils have developed in mountain regions. The humus layer is dark gray with a brownish tone and it has a clumpy - grainy texture. Soil of this type is found at an elevation of from 1,300-1,500 to 2,500-3,000 meters.

In the sub-Alpine belt meadow-steppe soils are common. They are called brown soils and are divided into two types: brown--having more humus (over 6 percent) and light-brown--having less than 6 percent humus. The former are found on moister slopes; the latter--on drier.

The Zaravshanskaya and Ferganskaya valleys and the Bukharskiy and Tashkentskiy oases are long-time regions of irrigated farming. The serozems that developed here have changed their composition and structure. Layers of cultivated soil that at times reach 1.5 meters in depth have developed and are characterized by a large reserve of humus and nutrients.

The use of land resources in agricultural production brings up the problem of conserving them and maintaining them. Large-scale work is being done to solve this problem. A complex of measures foresees the introduction of fertilizers, flooding and combatting erosion and salinization.

The application of fertilizer is widely practiced in the entire region of Central Asia and productivity has increased significantly as a result.

In Central Asia over 2 million hectares of land are salinated. As a result of this there is a significant underproduction of cotton. In recent years there has been an active struggle to combat salinization. Open horizontal drainage, which is less effective and occupies up to 15 percent of the area of fields, has been replaced by closed or vertical drainage.

Wind and irrigation erosion bring great losses to agricultural production. The struggle against it includes planting trees and shrubs around fields, roads and irrigation ditches; forbidding the felling of trees and shrubs and planting vegetation that reinforces sand; constructing various protective structures; surface plowing; developing methods of irrigation that will not erode the soil since irrigation erosion depends basically on the direction of water input.

The natural conditions of the plains and foothill regions of Central Asia enable us to produce agricultural products only on irrigated lands. Most of the land that is utilized here for irrigation farming is found on alluvial and foothill plains (over 80 percent) at an elevation of up to 1,000 meters.

Almost half of all irrigated land is occupied by cotton (in 1978--2,788,000 hectares); the other half is in feed crops (1,213,600 hectares), and grains, primarily wheat, corn and rice (829,000 hectares). The remainder of the area is in sugar beets (about 50,000 hectares), haylands, pastures, as well as orchards and vineyards.

An important goal in the agricultural use of irrigated land is the improvement in the productivity of crops. The productivity of cotton almost tripled (from 10.8 to 27-28 quintals per hectare) between 1913 and 1978. Our goal for all of Central Asia is to achieve an average yield of 30-35 quintals per hectare. Leading enterprises have already achieved this indicator. The problem of increasing the productivity of grains is urgent. In recent years 15-22 quintals per hectare have been produced here.

A considerable expansion of irrigated land is planned. Calculations made in recent years show that in Central Asia there are about 12 million hectares of land that can be developed with irrigated farming. However, the shortage of water resources is holding back this development.

In the mountainous regions of Central Asia there are considerable reserves of land that could be developed into dry-farming land. At the present time there are about 8 million such lands and of these only 1.2-1.8 million hectares are cultivated. The reserves of dry-farming land will enable us to increase the area of plowland by a factor of 2-3.

The regions of dry-land farming are characterized by unique natural conditions. Here there is a sufficient amount of warmth, more than the minimum amount of precipitation which is necessary for raising agricultural crops (no less than 250 millimeters). Most of the precipitation occurs during the winter. The frost-less period fluctuates between an average of 200 to 270 days per year. Based on natural conditions, dry-farming lands are divided into those provided with precipitation and those that are not. Sometimes there is a category for dry-farming land that are partially supplied with precipitation.

Those that are not provided with precipitation are the lands where there are fewer than 400 millimeters of precipitation; lands with more than 400 millimeters of precipitation are considered lands that are provided for. Of course this division is conditional but nevertheless the selection of cultivated crops in various dry-farming zones is different.

The soil cover that has formed on dry-farming land also varies according to zone. In areas with fewer than 400 millimeters of precipitation serozems are common, both light and dark. Areas with more precipitation include brown, light or dark chestnut soils and in some cases even chernozems (Issyk-Kul'skaya Basin).

Dry-farming land that can be used as plowland is used to cultivate grains and feed crops. Some of it is used as pastures and haylands. Here there are over 13 million hectares of lands that could be used as pastures and about 4 million hectares that could be used as haylands.

Most grain crops are found on lands with levels of 500-800 meters, but harvests here are low (4-5 quintals per hectare without irrigation).

The intensification of dry-land farming can be achieved by changing the general structure somewhat. One way would be to develop lands with less than 300 millimeters of precipitation annually using irrigated farming. Without irrigation the grain harvests here are small even during the most favorable years. It would be expedient to develop farming on mountainous dry-farming lands (900-2,000 meters) where at the present time, for example, only 10-20 percent of the area is occupied in grains in Uzbekistan. The natural conditions of these rayons are favorable for the production of grains, the amount of precipitation equals 400-700 millimeters and harvests are stable and large.

The dry-farming lands of Central Asia are also used to produce feed crops. In some areas artificial pastures are being created and alfalfa, sainfoin, wheatgrass, etc.

are being sown. The most valuable crop in feed production, alfalfa, yields 50-80 quintals of green mass and 12-30 quintals of dry mass per hectare and during moist years it is possible to produce three harvests per year. In some regions dry-farming lands are used to produce sugar beets for livestock fodder, feed and table watermelons, etc.

As we have already said, a large land area in Central Asia is occupied by pastures. In the plains they are divided into sandy, clay and gypsum deserts and river valleys. The pastures can be used all year round and yield the most inexpensive feeds. Nevertheless, their productivity is low--1-3 quintals per hectare (Table 2).

Table 2

Total Area of Pastures and Haylands in 1978, Millions of Hectares

Republics	Land in Use	Total Pasture Area	Haylands
Uzbek SSR	26.2	21.8	0.1
Kirghiz SSR	10.1	8.5	0.2
Tadzhik SSR	4.2	3.3	-
Turkmen SSR	30.0	28.9	-
Total	70.5	62.5	0.3

Desert pastures can be used for sheep raising, camel raising and to a lesser degree for horse raising and for raising large-horned cattle.

Commonly found on sands are white and black haloxylon, saltwort, dog's tooth violet, ephemers and ephemeroids--ilak, azatis, and sometimes wormwood, singren and sedge. The productivity of pastures here is 0.6-2.3 quintals per hectare. In gypsum deserts wormwood-Russian thistle pastures are common. The capacity is the same as that for sandy deserts. The pastures of clay deserts have a somewhat higher capacity--0.8-4.2 quintals per hectare.

In the mountain regions there are pastures at all elevations except the nival zone. In area they are smaller than plains but their productivity is an average of 2-2.5 times greater and for this reason they play an important role in the development of livestock raising in Central Asia. During the summer and late spring periods the livestock is moved to the adyry and then gradually to pastures located in the central mountain region, where it sometimes remains throughout the summer. Some of the livestock is moved to highly productive high-mountain pastures, but there isn't enough room to support the entire herd there.

The total area of mountain pastures in Central Asia comprises over 18 million hectares, of which over 2 million hectares are in the Kirghiz SSR, about 3 million in the Tadzhik SSR, about 6 million in the Uzbek SSR and 1.1 million in the Turkmen SSR.

The pastures at the various elevations are characterized by different vegetation and different uses for the vegetation.

in the foothill regions and in the zone of adyry (up to 500-1,000 meters) pastures can be utilized in the early spring and fall. In some areas there is little snow and livestock can be kept there even during the winter. The vegetation includes primarily ephemeroids such as karailak, kartych (bulbiferous meadow grass) and many ephemers--bromus, mal'kol'miya, arpagany, astragaly, egilopsy. The average annual yield of dry edible mass is 1.5-3.1 quintals per hectare. During favorable years productivity doubles and during dry years it is about 60 percent of the average.

Higher in the central mountain region at an elevation of from 800-1000 to 2000-2500 meters the grass cover is represented by cereals--meadow grass, awnless brome grass, legumes such as vetch, sainfoin and mixed grass. Average annual harvests are increasing and fluctuate between 3 and 8 quintals per hectare. Feed procurement is possible here. Pastures can be used in the spring and fall primarily.

In the high mountain region we find only summer pastures consisting of valleys between mountains and syrt valleys. Most of the livestock here can be pastured during 1.5-2.5 summer months. The snow cover is usually small and some of the livestock can be maintained here all year. The grass cover comprises mainly legumes, umbellates, cereals and mixed grasses. The average annual yield of dry edible mass is 5-10 quintals per hectare.

The low productivity of pastures in the plains require their development. Pastures are being sown in perennial grasses, feed crops, various shrubs and semi-shrubs. In mountain regions pastures are usually infested with harmful inedible vegetation and rubbly material and are subject to erosion. Clearing this land and eliminating weeds and shrubs is very effective. The basis for development is plowing the eliminating sod with subsequent creation of sown grass stands. If these artificial pastures are irrigated productivity increases sharply to 20 and sometimes to 40-50 quintals per hectare of hay.

Conclusions

1. Central Asia is a region with a great reserve of land resources. At the present time about 70 percent of the total area in the territory is being used agriculturally and the main land masses are being utilized as pastures for livestock. Plowland occupies about 60 percent of the area and is utilized in irrigated and dry-land farming.

2. Irrigated farming is widespread on alluvial and foothill plains where industrial, grain and feed crops are concentrated. From 1972 to 1978 the area of irrigated lands increased by 0.8 million hectares.

3. Dry-land farming is possible only in mountain regions. The reserve of available land that can be used in dry-land farming comprise over 6.5 million hectares. One of the ways to develop farming is the intensification of the use of mountain dry-farming lands at an elevation of 900-2,000 meters having natural conditions that are favorable for the production of grains and feed crops.

The low productivity of pastures in plains calls for the necessity to develop them by sowing perennial grasses, feed crops, shrubs and by creating artificial pastures.

4. The pastures of mountain regions with a high productivity require frequent clearing, the elimination of weeds and the development of sown grass stands and irrigation.

Greater attention to the agricultural use of land resources will enable us to significantly increase the production of farm and livestock products here.

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GREATER LOCAL INDEPENDENCE WITHIN PLANNING SYSTEM NEEDED FOR FARMS

Moscow LITERATURNAYA GAZETA in Russian No 50, 10 Dec 80 pp 10-11

[Interview with V. A. Tikhonov, academician of VASKhNIL: "For the Sake of the Final Goal"]

[Text] "For the sake of successful implementation of the food program, insure unified planning, proportional and balanced development of the sectors of the agroindustrial complex, a significant strengthening of its material-technical base, improvement of economic ties between sectors, and organization of clear-cut cooperation among them to increase agricultural production and improve the preservation, transportation, processing, and delivery to the consumer of agricultural output — this is from the draft document of the CPSU Central Committee for the 26th party congress, entitled "Basic Directions of Economic and Social Development of the USSR for 1981-1985 and the Period until 1990.

Our LITERATURNAYA GAZETA correspondent asked Academician of VASKhNIL [All-Union Agricultural Academy imeni Lenin] V. A. Tikhonov to answer a few questions about improving the agroindustrial complex and how ties between the kolkhozes and sovkhozes and their partners are managed.

[Question] Vladimir Aleksandrovich, I think it would be good for us to stipulate immediately what these concepts mean. What are the "food program" and "agroindustrial complex"?

[Answer] Two characteristics singled out by L. I. Brezhnev at the October Plenum of the CPSU Central Committee are unquestionably the most significant in defining this complex. On the one hand, there is the tie between agriculture and the service sectors of industry, procurements, storage, transportation, processing of agricultural output, and so on, all the way to the food stores. On the other hand, there is planning, financing, and management of the agroindustrial, food complex as a single integrated unit. All this is to be done in the name of good final results.

At the present time it is still difficult to describe this system in detail. It is still being thought through and worked out. We can get a better understanding of the conception of it by looking at the example of our republics. Each one of them has kolkhozes and sovkhozes, a ministry of Land Reclamation and Water Management, a Sel'khoztekhnika association, rural construction, ministries of food and milk and dairy industry, a procurement system, a mixed feed industry, and so on. All these departments taken together make up the agroindustrial complex of the republic. What happens today? Each of the departments except agriculture is financed and planned by USSR agencies from above. Only agriculture receives capital from the budget of the republic itself and is subordinate to republic agencies. The countryside needs a definite volume of work in land reclamation, technical service, and construction. But all the allied sectors receive their plans and finances from above! Very often this does not meet the needs of the kolkhozes and sovkhozes of the republic. So we get a situation where everyone would seem to have the same jobs, but each organization has its own plan. The unified system is split up into distinct, independent units that are isolated from one another. What has to be done? Obviously, financing and material resources need to be concentrated at the republic Council of Ministers. It could distribute them among the sectors cooperating with agriculture so that they are all working together, toward the final results. Of course, a certain part of the output of the republic will be passed on by plans to form USSR funds. The idea of the proposals is that the Council of Ministers of each republic should receive production resources and finances for the entire agroindustrial complex "in one line," and pass them on to its own specialized services.

[Question] And how will this be distributed within the republic?

[Answer] Agriculture must be the primary customer in the couplex. Who knows better than the kolkhozes and sovkhozes which machine they need, how many, and what things must be done first of all and which can wait. It is the same with fertilizer, land reclamation, irrigation work, and the like. It is extremely important to distribute resources between agriculture and its partner sectors on democratic principles, ultimately, in the long run, bearing in mind the same final result — food. Suppose that the land improvement organizations of the republic are obligated to do certain jobs for agriculture. It is the kolkhoz that should be the client and demand what it needs; the order should not come down by sectorial plan from the Ministry of Land Improvement and Water Management. The republic organizations should regulate these questions of intersectorial cooperation. And there must be a more precise delineation of the rights and obligations of not just the kolkhozes but also the enterprises of processing industry, retail trade, and agricultural service.

[Question] In light of all these plans and proposals, what is your view of the currently existing procurement system?

[Answer] It seems to me that it must be simplified. After all, the system was introduced in a time when relations between the state and the kolkhoz were different. This is what happens today. The harvest is carried out and the grain is hauled off to state granaries. Everyone is happy: there will be enough bread. The grain is hauled to elevators. But they do not have

adequate capacities, and grain is sometimes stored improperly. But that is not all. When the procurement rush ends, at least 35-40 percent of the grain is loaded into trucks and hauled back to the kolkhozes and sovkhozes as feed. It is not simply returned. The grain which the kolkhoz raised in its own fields is sold at the state purchase price, but it is bought at a hefty wholesale price. I have calculated that as many as 20 million truck trips are used hauling the grain back and forth.

I think that the procurement organizations should only take as much grain from the kolkhozes and sovkhozes as is needed for USSR resources. What about the grain that is returned for feed purposes? The kolkhozes, sovkhozes, and interfarm associations should be given an opportunity to conclude direct contracts with mixed feed enterprises. After all, we now have two types of mixed feed industry that operate in parallel. One is within the procurement system and is obviously not handling its production assignments, while the other is at the farms themselves. A third system is being set up on cooperative principles. Both of the latter systems should be developed. The industry managed by agroindustrial associations seemed especially promising to me. It can have rayon or interrayon plants and process the grain on the spot. As for state enterprises to produce feed, again there should be direct, mutually advantageous ties between them and the kolkhozes. I mean contracts concluded for several years in advance. This develops initiative and enterprise.

[Question] It is common knowledge, Vladimir Aleksandrovich, that losses of agricultural products are a problem at every stage: in the field and during hauling, procurement, processing, and storage. In the southern parts of the country during the "peak" months, for example, some farms plow under ripe tomatoes because they are not able to pick and ship them. But at the same time the vegetable stores in the cities do not at all have an abundance of tomatoes. How can this difficult problem be solved?

[Answer] We are not by any means getting everything we could from nature. Failure to harvest is one kind of loss. There are many more direct forms. What do they involve? Poor roads, poor storage facilities, and poorly developed material-technical facilities in state processing industry.

[Question] This would seem to be the place to include the fact that few vegetables and fruits are processed at the kolkhozes themselves.

[Answer] That, I think, is a debatable question. I am an advocate of narrow specialization and narrow division of labor, but combined with a well-organized, mutually advantageous system of cooperation among specialized enterprises. Of course, in places where there is a need to employ kolkhoz members year-round, supplementary production can and needs to be set up. But a significant share of the processing of agricultural raw material is also seasonal. It is difficult to harvest the crop from the field and process it at the same time.

[Question] Interfarm associations are being formed. Isn't it easy for them to process a certain proportion of the vegetables, fruit, and possibly also meat? In Hungary, for example, this kind of industry is well developed at cooperatives. I visited such an interfarm meat combine in the

town of Hernad. It processed and packaged chicken for the stores in Budapest and for export.

[Answer] That is a possible alternative. But I believe that we must make our foundation a strong state processing industry. For example, freezing and storing meat using contemporary world technology is very expensive and can be done only by enterprises which have good equipment. This generally means state enterprises. As for the kolkhozes and sovkhozes, they should be oriented chiefly to clear-cut specialization in crop farming and animal husbandry. Let them produce meat and milk and raise grain, vegetables, and fruit. But the processing is a matter for other sectors.

[Question] The idea of specialization comes from the character of natural zones and the climatic characteristics of particular regions. Common sense itself suggests it. If unique grape varieties grow in the Alazan valley of Georgia, it makes no sense to plant sugar beets there. And ideally, processing is more convenient for a large enterprise. That is clear. But still, I do not understand why a rich, powerful kolkhoz cannot set up a processing enterprise, on share principles with its neighbors. We are aiming to streamline the process, but in fact we often do not receive the desired result. Certainly big processing plants for agricultural raw materials are a fine idea. But at the present time they are not handling their assignments and they do not have top-notch equipment. They lack transportation and have to use every opportunity to prevent spoilage of the fruits of peasant labor.

[Answer] Yes, I agree with you on this. We have to use literally every opportunity to save the harvest and give the customer the necessary amount and assortment of food. But we should not permit outdated methods. And we must keep in mind the future prospects that I discussed earlier. A state enterprise does not have to be enormous. At the present time meat is hauled from the farms to processing enterprises from a radius of up to 100 kilometers or more. That is quite far. We still drive livestock in from surrounding areas and haul them to the meat combine where they have to wait their turn for slaughter. During the wait they lose at least 10-15 percent of their weight. In some oblasts it is sometimes necessary to haul livestock as much as 200-250 kilometers. What kind of management is this? There should be a livestock processing enterprise for every two, or at a maximum three, rayons. We should not build one gigantic plant for an oblast.

In short, many different steps must be taken for the agroindustrial complex to function smoothly and give all the sectors participating in it a mutual interest. We must use every means to expand economic democracy in the local areas, to develop the system of direct contracts with mutual accountability, and to allocate resources to the customer, that is, to agriculture. Let us look at Vil'yandskiy Rayon in Estonia. What did they do? It does not seem to be anything special. The rayon has kolkhozes, sovkhozes, two Sel'khoztekhnika divisions, and a meat combine. Each unit formerly worked separate from the others; each "pushed" its own plan. But then the rayon industrial association, abbreviated "RAPO," was formed. The RAPO council, which includes the managers of all the organizations and, of course, the chairmen of the kolkhozes and directors of the sovkhozes, receives a plan for total output, how much must be produced and what. Everything else is decided within the association. The RAPO council modifies contract relations

between the kolkhozes and their partners. It is important that all the operating units have an interest in the same thing: to produce as much output as possible.

[Question] From my trips to rural areas in different zones of the country and from numerous letters to the editors I am aware of all the complaints that kolkhozes have against Goskomsel'khoztekhnika. You could say that these complaints are growing each year like a snowball. How do you, Vladimir Aleksandrovich, evaluate the activities of this organization, which is perhaps the kolkhoz' main partner. What do you think are the problems in this area?

[Answer] Goskomsel'khoztekhnika has concentrated in its own hand an enormous number of machine tools and equipment for repairing agricultural machines. Nonetheless, kolkhozes and sovkhozes often do not find it advantageous to use the services of this organization, which is indeed their main partner. Why is this? The rates for work are so high that it makes no sense for farms to turn to this very powerful, well-equipped organization for help. They do so only when there is no choice. But it is not just a matter of prices. In reality, there is no effective control on the quality of repair work. The kolkhoz has no right to bring any complaints. And payment for work done is collected through the bank on an individual basis. Sel'khoztekhnika is the principal owner of the stock of spare parts which are so scarce today. The farms cannot receive them directly from the plants. Again, whether they like it or not, they have to go to that same partner. But it releases parts only during the repair process. Suppose that the kolkhoz itself is capable of fixing the machines, if only it had spare parts. Why certainly, they tell the kolkhoz chairman, you can have spare parts; pay the full cost of the repair job and you will get the spare parts. Then you can do what you like with them. And the farms actually do this just to be sure that the repair job is done in the way they want it done. We now have a kind of monopoly of the producer, Sel'khoztekhnika, over the customer, the kolkhoz. As the system has developed the farms have no great desire to go to Sel'khoztekhnika every time. But Sel'khoztekhnika needs to use its personnel and resources somehow, and it is forced to do work that has nothing to do with the land and the farmer. It manufactures industrial equipment and performs orders for enterprises that are unrelated to agriculture. In this way the association increases its turnover. But the proportion of repair it is doing for the kolkhozes and sovkhozes is steadily declining. Fifteen years ago Sel'khoztekhnika did roughly 30-35 percent of all such work, but today it is just 19 percent. The rest, which is the lion's share, is done by the farms themselves, although they do not have proper equipment or personnel.

[Question] But many kolkhozes have set up respectable workshops where they repair their machinery, haven't they?

[Answer] Yes, they do, in order to avoid unhealthy dependence. Two independent repair systems are operating in parallel today. The dispersion of capital is enormous. It all ultimately amounts to waste. The customer takes what is offered, not what he truly needs. At the present time there is no other way. In reality, of course, there is. I have in mind the system of two-way ties between agriculture and all its partners, the associated sectors.

No planning organization, not even the most ideal ones, will be able to plan production rationally if it is unable to take precise account of the wants of the customer. At the 25th CPSU Congress L. I. Brezhnev pointed out that the user of products should have an opportunity to influence the producer.

In short, we need feedback.

[Question] What is standing in the way?

[Answer] There are many factors. I would like to mention one very important one. This is excessive centralism and underestimation of democratic principles in planning. In this case the shortcomings are really nothing but an extension of our strong points. The planned economy is one of our great achievements. But we cannot adhere to absolutely rigid control. In his talk at the October 1980 Plenum of the CPSU Central Committee L. I. Brezhnev discussed a correct ratio between centralism and democratic principles. If the sectors are given the right to greater independence in deciding what to buy, when and in what quantity, we will be able to eliminate many of the disproportions that we have today.

[Question] Vladimir Aleksandrovich, doesn't it seem to you that in many cases during the development of the system of agroindustrial integration and interfarm cooperation the functions and rights of the kolkhozes are somehow overly regulated, as if their wings were being clipped?

[Answer] I believe that as the organization of the economic systems is refined the kolkhozes not only should not lose any of their rights, they should gain strength and scope and receive greater prospects. We do not need the kind of specialization and concentration that infringes on the sovkhozes and kolkhozes and does not let them develop to their fullest. This is a complex process and it must move gradually, without haste or prodding. Each kolkhoz and sovkhoz is given an active role within the rayon industrial association. Economic advantage should be paramount in the process of cooperation and specialization. I want to emphasize that the farms must be given an opportunity to use contract relations with their partners: poultry factories, mixed feed plants, and the like. In this case the kolkhoz will be more active and enterprising and, I am sure, the results will soon show. It goes without saying that interfarm cooperation does not mean replacing kolkhozes and sovkhozes with associations. They should be developed and strengthened. In some places interfarm cooperation actually leads to a weakening of the kolkhozes and sovkhozes. This must not be permitted.

As for specialization, there are still many obstacles. Suppose that specialized enterprises are being set up in a certain republic. The republic itself raises many crops. But with a multisectorial system it is difficult to carry on true specialization. The country is short of high-value feeds, in particular corn. Where does it grow well? In Moldavia, the Northern Caucasus, and a few other regions. It appears that corn production should be concentrated there. They have the right climate and they have experience. Wheat plantings in those regions could possibly be reduced somewhat, and increased in other zones.

[Question] But this obviously occurs because of imperfect and maladjusted regional ties. If a certain region cuts back on wheat plantings, this means that another region must give it the grain. But what guarantee is there that it will?

[Answer] The planning system must provide a guarantee against provincial mistakes. I agree, though, that it is not a simple problem. Nonetheless, we must establish specialized zones for production of basic commodities with concurrent development of processing industry, storage facilities, and the road and transportation system. We have such a diversity of soil and climatic zones that we must use their potential intelligently and wisely. Our system of rational specialization should give the kolkhozes, sovkhozes, and associations freedom to choose their special areas and orient them to maximum utilization of natural conditions and biological potential. But we need to organize interregional exchange and allow the republics and oblasts to exchange products. We raise potatoes in absolutely every zone except the Far North, both in regions where they grow well and where they do not. We plant them everywhere, regardless of yield.

We are even expanding the production of potatoes in Uzbekistan. But that republic produces one of the best table grapes in the world as well as cotton, vegetables, and fruit. We must make it profitable for Uzbek kolkhozes to raise and export this grape to other regions. At the present time it exports very little. This outstanding grape is used for very low-quality wines and cognacs, when it is so delicious in its fresh, natural form. Uzbekistan needs potatoes, but the necessary quantity is not being delivered. So they are forced to raise them themselves. But the Uzbek soil is not as good as potatoes as the soil in Belorussia or Siberia is.

[Question] Vladimir Aleksandrovich, if we were to briefly summarize what we have said, what would you consider the main point?

[Answer] The main thing to emphasize, perhaps, is the scale of work facing us. Carrying out the food program outlined in the draft documents of the CPSU Central Committee for the 26th party congress, entitled Basic Directions of Economic Social Development of the USSR for 1981-1985 and the Period until 1990," will demand hard, concentrated work by an enormous army of scientists, specialists, and all the Soviet people. We must rethink the role of the kolkhozes, sovkhozes, and all their partners and modify the system of their relationships in principle. At the present time the producer in reality dominates the consumer, which leads to high costs, losses, and disproportions. The principal objective of the food program is to provide the necessary quantity of high-quality food products. We will achieve this more quickly if the consumer is both the primary customer and the primary controller in all stages of development of the agroindustrial complex.

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AGRO-ECONOMICS AND ORGANIZATION

CONFERENCE REPORT ON ORGANIZATION OF NEW, DEVELOPMENT OF EXISTING SUBSIDIARY FARMS

Moscow SAKHARNAYA PROMYSHLENNOST' in Russian No 1, Jan 81 pp 57-59

[Article by L.V. Solov'yeva, non-staff correspondent at the Gubinikha Sugar Plant: "Greater Attention To the Organization of Subsidiary Farms"]

[Text] In June 1980, an all-union conference-seminar on the subject "Exchanging of Experience With Regard to the Organization of New and the Development of Existing Subsidiary Farms of Enterprises, Organizations and Institutes of USSR Minpishcheprom [Ministry of the Food Industry]" was held at the Gubinikha Sugar Plant of the Khar'kov Production-Agrarian Association of Minpishcheprom for the Ukrainian SSR.

The conference-seminar was organized by the agricultural section of the Central Administration of the NTO [Scientific and Technical Department] of the food industry, the section for agricultural production and raw materials procurements of the NTS [Scientific and Technical Council] of the USSR Ministry of the Food Industry, the Ministry of the Food Industry for the Ukrainian SSR, the Ukrainian Republic's NTO for the food industry and by TsNIITEIpishcheprom [Central Scientific Research Institute of Information and Technical-Economic Studies of the Food Industry].

The following individuals participated in the work of the conference-seminar: Deputy Minister of the USSR food industry A.T. Makarov, Deputy Minister of the food industry for the Ukrainian SSR I.Ye. Kirichenko, Deputy Minister of the food industry for the RSFSR M.A. Chaplin, Deputy Minister of the food industry for the Belorussian SSR P.I. Pisenko, Deputy Minister of the food industry for the Kazakh SSR Ye.I. Dzherembayev, Deputy Minister of the food industry for the Georgian SSR T.K. Dzhabadari, Deputy Minister of the food industry for the Lithuanian SSR P.P. Ivanauskas, Deputy Ministry of the food industry for the Armenian SSR V.A. Kazaryan, the head of a section at AUCCTU G.I. Tarasov, the general directors of production and production-agrarian associations of the sugar, tobacco, oil and fat, beer and non-alcoholic, alcoholic, canning, baking, fruit and vegetable and wine-making industries and representatives of other organizations.

The leaders of Dnepropetrovskaya Oblast organizations also participated in the work of the conference: the secretary of the CPSU oblast committee V.A. Sergeyev and the chairman of the oblast committee of the professional trade union for food industry workers I.Ye. Shatalov.

The Deputy Minister of the food industry of the USSR A.T. Makarov delivered a report on the manner in which the enterprises, organizations and institutes of the USSR Ministry of the Food Industry are carrying out the decree of the CC CPSU and the USSR Council of Ministers entitled "Subsidiary Farms of Enterprises, Organizations and Institutes." He commented upon the important role being played by subsidiary farms in increasing the production of agricultural products and making it possible to supply the manual and office workers and their families with greater quantities of meat, milk, vegetables, potatoes and other food products. By the end of 1979, 865 subsidiary farms and fattening stations had been created within the USSR Ministry of the Food Industry system, that is, only at one fourth of the branch's enterprises, organizations and institutes.

A number of ministries of the food industry and other organs for controlling the food industry of the union republics are not implementing specific measures aimed at creating new subsidiary farms. In particular, not one subsidiary farm has been created at enterprises of the food industry ministries for the Lithuanian SSR, Latvian SSR or Estonian SSR, within the Soyuzmargarinprom Association or in a number of other organizations.

Some enterprise leaders, as pointed out by A.T. Makarov, simply refer to the difficulties that arise and thereafter further delay the creation of agricultural departments. This adversely affects the ability of their collectives to solve the socio-economic tasks confronting them: improving the food of workers, reducing personnel turnover, creating stable production collectives.

Opportunities for organizing and developing subsidiary farms are to be found at all enterprises of the food industry. This includes, for example, the cultivation of tracts of land that were not used earlier, tracts which belong to an enterprise, the stocking of water areas and utilization of the heat of waste condensates for the heating of hothouses.

In those areas where the leaders are displaying additional concern, large quantities of vegetables, fruit, citrus products and potatoes are already being grown at the present time and meat, milk and fish being produced. This applies first of all to the collectives of the Gubinikha Sugar Plant, the Verkhnedneprovsk Starch-Syrup Combine, the Sugar Plant imeni Kalinin and the Kokand Order of the Red Banner of Labor Oil and Fat Combine imeni Kalinin.

The status of the subsidiary farms releases them from the plans for selling agricultural products to the state. All of the goods produced remain at the enterprise for improving the level of nourishment in the childrens' institutes and in the dining halls.

The best farms, based upon the creation of their own feed base, are able to sell young cattle stock and vegetable crop seedlings to an enterprise's workers and to furnish assistance in working the private orchard and garden plots.

Correct action is being taken by those leaders who, in connection with the organization and maintenance of subsidiary farms, cooperate with other enterprises (proportional participation in capital investments, feed and manpower for servicing the farms).

A.T. Makarov recommended that the experience of enterprises which organized subsidiary farms for the raising of vegetables, potatoes and fruit at recreation bases be disseminated. In this manner the workers would achieve active relaxation while working within their capability.

The government has tasked Goskomsel'khoztekhnika for the USSR with supplying the subsidiary farms of any branch of industry with the equipment required for mechanization. For the purpose of carrying out this decree, the enterprises must submit requisitions to the zonal administrations of Sel'khoztekhnika.

A.T. Makarov informed those participating in the conference that subsequently, when summarizing the results of the all-union socialist competition within the USSR Minpishcheprom system, consideration will be given to the existence of a subsidiary farm at an enterprise and also to the amount of agricultural goods produced by it.

The Deputy Minister of the food industry for the Ukrainian SSR I.E. Kirichenko noted that there are 75 subsidiary farms in operation at industrial enterprises at the present time. These farms have recultivated 650 hectares of unsuitable and long-fallow land and the number of hogs being maintained on them has reached 4,700 head. By the end of 1980, the number of subsidiary farms will have reached 190. A program of intensified agricultural production is being followed. Among the enterprises, considerable successes have been achieved by the Dolinskaya Sugar Plant of the Kirovograd PAO.

Within Minpishcheprom for the Ukrainian SSR, a Department of Subsidiary Farms has been created for the purpose of coordinating overall management.

The Board of Minpishcheprom for the Ukrainian SSR has adopted a decision on the organization of subsidiary farms at all enterprises of the republic's food industry.

The director of the Gubinikha Sugar Plant, E.D. Rylik, shared his experience in organizing and developing the subsidiary farm. The subsidiary farm was organized at the plant in 1978, initially in unsuitable facilities which gradually underwent replacement. The requirement for supplying the livestock with feed is being met by growing forage crops on recultivated and unproductive lands belonging to the plant; collecting food waste products from the dining halls and housing areas; cooperation with the Dnepropetrovsk Food Concentrate Plant; reserve of dried pulp residue. The farm is reproducing its own young stock. Zoo-veterinary services are being furnished on a contractual basis by specialists from neighboring kolkhozes.

Vegetables, potatoes and fruit are being grown on the subsidiary farm and a circulating water supply pond is being stocked with fish.

The subsidiary farm has been established as an independent and equal subunit of the plant. It has proven to be of considerable assistance in improving public catering for the workers. All of the dining halls are included on the plant's balance.

Difficulties exist mainly in connection with a lack of funds for construction materials.

The director of the Verkhnedneprovsk Starch-Syrup Combine, I.Ye. Grebennik, raised the question concerning the organization of ORS's [department of workers' supply] at

the enterprises, with these departments being able to solve completely all problems concerned with supplying the workers with the needed materials.

At the present time, the enterprise's subsidiary farm is maintaining 130 hogs, 40 young bulls and a certain number of poultry. Production waste products are being utilized for feed purposes. Forage and vegetables are being produced by means of field crop husbandry. The hothouse has an area of 1,500 square meters, which satisfies the farm's requirement for vegetable seedlings and that of the enterprise's collective -- for early vegetables.

The subsidiary farm supplies products for the dining halls of schools, hospitals, the childrens' combine and the plant workers' dining hall. The cost for a dinner consisting of three dishes is 30 kopecks.

For the tending of the plantings, all of the land tracts on which garden crops are grown are distributed among the departments of the enterprise. The subsidiary farm of the combine was organized in 1965 and nobody entertains any doubts regarding the need for it.

The combine has a horticultural society. It has 700 garden plots at its disposal. The enterprise supplies them with water and electric power and privileges are extended to the gardeners with regard to the building of small homes. Surplus fruit is turned over to the childrens' combine.

G.V. Shadnykh, the director of the Sugar Plant imeni Kalinin of the Kursk Production Association, of the sugar industry of Minpishcheprom for the RSFSR, discussed the profitable operational experience of the plant's subsidiary farm. He noted that in order to reduce the production cost for meat on the farm, it was necessary to mechanize the feed preparation work and the tending of the livestock, with the simple mechanisms required for these purposes capable of being produced in the mechanical workshops of any sugar plant. Extensive use is made on the farm of the waste products of production and pulp residue reserves. The plant's subsidiary farm maintains 98 head of large-horned cattle and it has a hothouse.

The Deputy General Director of a production association for the bottling of "Borzhomi" mineral water, V.A. Lazashvili, shared his experiences in organizing and developing a subsidiary farm in the association. The subsidiary farm has 9,000 fruit trees, 1,000 grapevines, 25 head of long-horned cattle, 40 hogs, 34 bee colonies and a hothouse with an area of 2,500 square meters. The farm supplies almost all of the food goods required by the association's collective.

The director of the Gindeshtskiy Sugar Plant of Minpishcheprom for the Moldavian SSR, I.G. Ovchenko, discussed the experience accumulated in the efficient use of internal resources for the purpose of producing meat on a subsidiary farm. In 1977, 20 head of large-horned cattle were procured and accommodated in poorly adapted and vacant facilities. Subsequently, an addition was built on to the facilitate so as to accommodate 30 more young bulls.

In 1979, one more facility for 30 head of cattle was built.

At the present time, the childrens' institutes are being fully supplied with meat and milk by the subsidiary farm. In addition, 27 tons of meat were sold to the plant's workers at a price of 1 ruble and 0.5 kopecks per kilogram.

The general director of the Khar'kov Production-Agrarian Association of the sugar industry for the Ukrainian SSR, V.M. Karasik, delivered a report on the work of creating subsidiary farms at enterprises of the association.

He stated that subsidiary farms were organized at nine sugar plants and 28 beet stations of the association. By the end of 1980, they will have been organized at all of the sugar plants. Experience has shown that the plants are capable of solving the problem of organizing farms using the existing tables of organization and available resources.

The speaker stated that the construction of the facilities should be carried out using the funds and limits allocated for the principal activity. In accordance with the governmental decree, a system of crediting is available for the development of subsidiary farms. The construction of hothouses involving utilization of the heat from discharge production waters should be intensified in every possible way and existing ponds for circulating and other types of water supply should be stocked with fish.

The plans call for the number of long-horned cattle at all subsidiary farms of the association to be increased to 1,000 head.

V.M. Karasik noted that the principal tasks confronting the subsidiary farms include improving public catering for workers concerned with the principal production operations and for the beet suppliers during the beet acceptance period at the beet stations, the mandatory organization at all plants of food services for the workers during the evening and nighttime shifts and lowering production costs so as to ensure that the cost for dinners does not exceed 25-30 kopecks.

The leader of a department at the USSR Goskomsel'khoztekhnika, A.V. Bossert, informed those participating in the conference regarding the extension that had been granted for submitting requisitions for 1981 (at the locations of the subsidiary farms) for agricultural machines, equipment and spare parts, following the procedures established for kolkhozes. The agricultural construction requirements for cement, slate, metal and mineral fertilizer can be satisfied on a special purpose basis through Sel'khoztekhnika.

The director of the Lyakhovichi Canning Plant of Minpishcheprom for the Belorussian SSR L.P. Leychenko, the chief of the Administration of Public Catering Enterprises of Uzplodovoshchprom M.B. Khudayberdyyev, the director of the subsidiary farm of the Bassol' ORS [Department of Workers' Supply] of RSFSR Minpishcheprom V.V. Klishin, the deputy director of the Lisichansk Baking Combine of the Voroshilovgrad Production Association of the baking industry of Minpishcheprom for the Ukrainian SSR A.F. Leonidov, the director of the food goods plant of the Food Industry Administration of the Cherkasskaya Oblast Executive Committee in the Ukraine A.V. Shevchenko and the chief of the Deapartment of Raw Materials of the Rovno Production Association of the canning industry of Minpishcheprom for the Ukrainian SSR T.I. Naumov.

In conclusion, the head of a sector of the AUCCTU, G.I. Tarasov, noted that the Presidium of the AUCCTU, based upon the results for 1979, conferred diplomas and monetary awards upon 87 subsidiary farms of industrial enterprises for having

achieved fine results, including the collectives at the Gubinikha Sugar Plant of the Khar'kov Production-Agrarian Association of Ukrsakharprom, the Sugar Plant imeni Kalinin of Minpishcheprom for the RSFSR and the Verkhnedneprovsk Starch-Syrup Combine of Minpishcheprom for the Ukrainian SSR.

During the conference, "Recommendations for Organizing and Developing Existing Subsidiary Farms at Enterprises, Organizations and Institutes Within the USSR Minpishcheprom System" were developed and approved.

The conference was conducted on a high organizational level.

Those participating in the conference carried out an inspection of the subsidiary farm at the Gubinikha Sugar Plant.

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IMPORTANCE OF PROPER LABOR ORGANIZATION IN AGRICULTURE

Moscow PRAVDA in Russian 6 Sep 80 p 2

[Article by Yu. Buzilov, corresponding member of VASKhNIL [All-Union Lenin Academy of Agricultural Sciences] and V. Bashmachnikov, candidate of economic sciences: "The Harvest Makes the Evaluation"]

[Text] The Debt to the Field

The road through the country seemed to cut the wheat fields in half, dividing them into different masses. One one side the stems are bent under the weight of the full ear. The other field is cause for alarm. What did the farmers do to cause such a poor harvest? There may be several reasons, but one of them, the quality of work, undoubtedly played a decisive role.

How could we achieve a situation in which grain farmers always strive to increase the fertility of the soil, to make the fields abundant?

There is no accident in interest exhibited by PRAVDA readers in the discussion that was begun by Kalini machine operators. Their article, as well as those by link leader V. Papkov and secretary of the Nikolayevskaya Oblast executive committee A. Zakharchenko, is imbued with great concern for improving the material and moral incentives of rural workers regarding the final results of labor and for raising the responsibility of each grain farmer in the efficient utilization of land.

The authors of the articles, noting the positive significance of accumulated experience agree that the harvest that is cultivated must become the measure of the amount of work done by the farmer. Not the volume of work, not the hectares travelled by tractors,but the final result--a weighty harvest--is important. The same conclusion was reached by scientists in the All-Union Scientific Research Institute of Economics, Labor and Agricultural Administration, which studied the experience of leading kolkhozes and sovkhozes where self-financing links and brigades were created.

Among these self-financing collectives were the so-called independent collectives which utilized periodic advances prior to the accounting for products. Their earnings depended greatly on the growth in productivity. For this reason they did not strive to increase work volume by decreasing quality, but instead concerned themselves with observing the needs of technology and with improving final results.

Such links and brigades were essentially a farming variation of the collective contract which was later widely developed in construction and industry.

Self-financing links and brigades turned out to be highly effective forms of labor organization. They started to be developed in all zones of the country. In the early 1970's in the RSFSR alone there were about 90,000 large and small links, including almost 10,000 independent links. However, during the second half of the 1970's their number began to fall. This is true particularly of links and brigades which received periodic advances and which numbered only 4,700 in 1979.

Involuntarily the question arises: If the effectiveness of labor of such collectives was proven by practical experience, then why is their number decreasing? There is more than one reason for this but we would like to emphasize the main reason--the serious inadequacies in the system of wage payments for products. The proportion of supplementary payments and bonuses is very low in the wages of machine operators--only 4-6 percent. In self-financing links and brigades this indicator is somewhat higher--an average of 10-15 percent. But even here it is lower than the levels at which incentives for the final results of production become a strong stimulus.

Sociological research has shown that at the current rate of annual wages for machine operators supplementary payments and bonuses for production would encourage work if they comprised 30-40 percent of wages. At the present time the level of self-financing incentives remains low and this is the result of imperfect methods for calculating evaluations of production. According to the model resolution on wage payments, their size is determined by dividing the plan wage fund by the planned production volume. In developing the resolution it was assumed that in planning a consideration would be made of the real possibilities of productivity growth. However, in practice the plan indicators of productivity are frequently enlarged, especially for feeds and some industrial crops, which results in an unjustified drop in the evaluation.

An analysis of the annual accounts of sovkhozes shows that the size of incentive payments foreseen by the resolution according to final results (25-30 kopecks per ruble of advances with some degree of plan overfulfillment) are secured only in 6-10 percent of enterprises that received the plan on the level of achieved indicators. Most sovkhozes, having intensive plans, cannot reimburse labor according to final results even when production output is increased per hectare of land and per ruble of cost of production funds. For this reason many machine operators are interested in raising their individual output rather than in the final results of collective labor. Frequently they have an indifferent or even a negative attitude towards the link organization of labor with advances and insist on the preservation of piece-work.

It is true that in practice a number of enterprises secure the necessary level of supplementary payments and bonuses for the final results. Thus, in the links of V. Papkov, V. Makhno and the brothers Chistyakov incentive payments for products at the end of the year reach 50 kopecks per ruble of advances and comprise over 30 percent of the annual wage. This size of supplementary payments creates a stable interest on the part of workers to produce large harvests.

Nevertheless, all of this is achieved only as a result of certain violations of the strict prescriptions of the Model Proposals on the Piecework-Bonus Reimbursement of Labor. In some cases the wage-rate for production is calculated on the basis of average productivity actually achieved over a period of preceding years. In other cases the collective is assigned a more realistic, "lowered" productivity goal as compared with general economic indicators. These types of practices are frequently looked upon by control-auditing organs as a serious violation of financial discipline. We feel that the time has come to improve the system of wage payments and to strengthen the cost accounting incentives for final results.

The extensive introduction of brigade and link contracts will encourage the use of more flexible forms of advances and the distribution of the collective wages among machine operators. These forms will include group piece-work, which has been introduced in some enterprises of Novosibirskaya, Saratovskaya and Krymskaya Oblasts, the awarding of contracts to workers with a consideration of the difficulty and quality of the work to be done, which has been done in Nikolayevskaya Oblast, the use of "participation coefficients", which has been applied by the machine operators of Ryazanskaya and Penzenskaya Oblasts. Taking this experience into consideration, we must give more rights to collectives to select the forms and methods of distributing wages among workers. We should not fear their diversity and strive only to two extreme variants--piecework or equal time-payments. Here it would be appropriate to recall what a great significance was placed by V. I. Lenin on the development of a great variety of variants for solving the questions of management organization, especially during the first stages of development of a particular economic process.

Another reason for the curtailment of self-financing collectives was the sometimes unjustified opposition to them by temporary large industrial links and detachments which are primarily involved in organizational-administrative methods. The judicious concentration of technology in such subdivisions naturally encourages the improvement in machine productivity and curtails the time it takes to complete field work. At the same time large reserves for improving final results of production are tied to the flexible use of technology. We feel that permanent self-financing collectives play a very special role in this.

In those enterprises in which the size of crop-rotation fields, technology and technique provide a basis for cultivating field crops using small links, during the harvesting period the small links are frequently united into a single harvesting-transport detachment that works by turns in the fields of cooperating collectives. In the same manner harvesting equipment is shared by many mechanized brigades working on small field areas. This variant of coordinating permanent and temporary collectives is relatively common in the enterprises of the Non-Chernozem Area.

In recent years various economic rayons have been creating brigades or links of machine operators who raise certain crops themselves on the territory of the entire enterprise. Specialized brigades deserve special attention. The relatively high concentration of crops enables us to form, within the specialized brigade, technological links and detachments of an effective size to perform the work that comprises the cycle of cultivation. At the same time 12-16 workers do not decrease the efficacy of a collective reimbursement for labor (including time-work but with differentiated advances).

However, this experience is being adapted slowly. In recent years many economic scientific-research institutes and agricultural departments of higher educational institutions have practically stopped the study of labor organizations and of improvements in collective organization with production payments. As a result the directors and specialists of enterprises and agricultural organs were left without regional scientifically-based recommendations on the use of brigade-link contractors under new conditions and they are forced to use a trial and error method in their search for the best method. We feel that in developing the five-year plan of scientific and research work the State Committee on Science and Technology and VASKhNIL should include the development of methodological and practical recommendations on the given question with a consideration of zonal characteristics.

In many oblasts of the country in the late 1960's and early 1970's attempts were made to introduce independent detachments rapidly on a large scale. Grave errors were made and a routine approach was tolerated. As a result many of them fell apart. Such cases discredited the progressive form of labor organization in the eyes of directors and specialists of enterprises.

A negative role is also played by the passive position of some directors and specialists with regard to collective contracts, which explains the lack of interest in introducing this form to a significant degree. We know that the assimilation of something new in production organization is usually related to additional expenditures. The collective contractor is no exception. From specialists he requires a strengthening of organizational work related to providing self-financing collectives with the necessary material and technical resources and to conducting active educational and explanatory work in the collective. With proper organization the returns can be seen during the second or third year. Not all production organizers are ready to wait for this and for this reason prefer to work in the traditional manner. Moreover, some directors and specialists, underevaluating the significance of the contract, attempt to decrease the incentive payments for products when large harvests are produced. This is encouraged by their fear to overdraw on plan wage funds, which could decrease their annual bonuses.

Experience shows that in those places where progressive forms of organization and labor payments have been introduced the directors and specialists are deeply convinced of their effectiveness, that in those places where work is introduced consistently, without unjustified speed, creatively and with a consideration of local conditions, in those places success is achieved. A consistent transition to a collective form of labor organization and wage payments will help the country's fields to become more abundant.

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IMPORTANCE OF SUBSIDIARY ENTERPRISES DISCUSSED

Moscow MYASNAYA INDUSTRIYA SSSR in Russian No 11, Nov 80 p 15

[Article by A. A. Mal'tsev, director of the Administration for the Procurement of Raw Materials of the Kazakh SSR Ministry of the Meat and Dairy Industry: "The Subsidiary Farms of Enterprises as an Additional Source of Production"]

[Text] In accordance with a resolution of the Central Committee of the CPSU and the USSR Council of Ministers, within the system of the republic's ministry of the meat and dairy industry purposeful work is being done to organize subsidiary enterprises for the production of agricultural products in order to supply food for workers and employees.

With this purpose in mind the ministry issued an order to all meat combines and production associations of the industry to organize subsidiary hog-raising, poultry-raising and rabbit-raising farms according to natural and climatic conditions, the availability of agricultural lands and the location of the enterprise. In order to organize subsidiary farms the ministry has obliged enterprises to petition local soviet organs for help in allocating land and supplying quality seed, sowing meterial, pedigree calves and other material and technical resources. The ministry turned to the Kazakh SSR State Committee on Production and Technical Supplies to Agriculture with a request to allocate agricultural machinery, equipment and spare parts to organizing and operational subsidiary farms according to the system created for kolkhozes and sovkhozes.

The work that has been done in organizing subsidiary farms in industrial enterprises in the republic has already yielded some results.

In 1979 the enterprises were allocated over 29,000 hectares of land. On 930 hectares barley was planted and gross yield equalled 8,708 quintals. Potatoes were planted on 34 hectares and the average productivity of potatoes per hectare comprised 67.5 quintals. Forty-five hectares were used to plant all types of vegetables and their gross yield comprised 1,656 quintals. Fruit orchards were planted on 33 hectares, producing 575 quintals of fruit.and 3,555 hectares of natural haylands and 426 hectares of land in perennial grasses produced 12,514 quintals of hay. The remaining 24,600 hectares of land were utilized as natural pastures.

As of 1 January 1980 the subsidiary farms of enterprises were fattening and raising 5,676 hogs, 1,660 rabbits, 685 sheep, 80 horses and 250 birds. From the fattening of livestock, poultry and rabbits during the last year the enterprises as a whole achieved 5,870 quintals of weight gain, which was sold for the public nutrition in cafeterias and children's institutions and for sales to workers and employees.

At the present time the 21 meat combines of the republic are taking measures to organize their subsidiary farms for fattening livestock and raising fruit, vegetable and melon crops.

During 8 months of the current year the enterprises of the meat and dairy industry achieved a weight gain of 3,700 quintals from subsidiary enterprises fattening hogs, cattle, sheep, horses and rabbits. By the end of the year it is expected that another 2,500 quintals of weight gain will be achieved.

Worthy of attention is the work experience of the Alma-Ata Production Association of the Meat Industry in organizing its subsidiary farms, in obtaining supplementary meat resources for securing public catering in cafeterias and children's institutions and for sales to workers and employees of the association.

In 9 months of 1980 the Alma-Ata association fattened 5,574 hogs directly on the territory of the meat combine and 1,893 quintals of weight gain were achieved from them. The average daily weight gain per hog comprised 602 grams. At the present time the association is fattening 3,000 hogs, including 110 females which produced 1,640 piglets. In addition the association fattens an average of 6,000 rabbits per year. The subsidiary farm fattens livestock and rabbits using its own feed. The association has 126 hectares of agricultural lands.

Positive results in the organization of subsidiary farms have been achieved by the Semipalatinskiy, Gur'yevskiy, Aktyubinskiy, Kokchetavskiy, Shchuchinskiy and Dzhambulskiy meat combines.

In 1981 the Ministry of the Meat and Dairy Industry of the Kazakh SSR plans to increase the number of hogs in subsidiary farms to 15,000, the number of sheep to 2,000, the number of horses to 200, the number of rabbits to 5,000, and the number of livestock to 200 head. A weight gain of 10,000 quintals is planned.

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DEVELOPMENT OF ANIMAL HUSBANDRY ON PRIVATE SUBSIDIARY FARMS URGED

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 12, Dec 80 pp 80-83

/Article by V. Shefer: "Potentials for Animal Husbandry on Private Subsidiary Farms"/

/Text/ The management of private farming is connected with considerable trouble. There was a time when some local managers were downright afraid that private subsidiary farming would divert peasants from work in public production. Practice shows that these fears are unfounded. In the opinion of L. Zhevako, chairman of the Kolkhoz imeni Karl Marx in Zhanasemeyskiy Rayon, Semipalatinskaya Oblast, it is the other way around. Most of the workers on this kolkhoz, who have exemplary private farms, are especially conscientious as far as their duties in public production are concerned. A. L. Ruzhechko, chief economist of this kolkhoz, cited figures confirming the advantage of animal husbandry on private subsidiary farms. For example, on the average, every family that has a cow, five or six sheep and a hog sells 290 to 330 kg of milk, 50 to 70 kg of meat and 3 to 5 kg of wool and hides to the state. It fully meets its needs for a number of food products from its private subsidiary farm. The possibility of keeping the necessary number of chickens, ducks or geese contributes to this. Some raise rabbits or turkeys. The kolkhoz members that acquire private subsidiary farms remain in rural areas forever more often than those that do not have them and they live well. The budget of such families enables them to build good houses, to buy modern furniture, to dress tastefully, to spend their leisure in a cultural way, to take trips and so forth.

V. D. Kholdeyev, first secretary of Zhanasemeyskiy Rayon of the Communist Party of Kazakhstan, notes a certain specialization of the subsidiary farms of the rayon's rural residents. It depends on the specific conditions, possibilities and traditions of every rural area. When the meadow is large and any kind of river flows in the area, for example, as on the Semipalatinskiy, Irtyshskiy, Zhanasemeyskiy and some other sovkhozes, a household without ducks or geese is rare and some families combine both with large-horned cattle and hogs. The Sotsialistik and Znamenskiy sovkhozes and the kolkhozes imeni Zhdanov and imeni KAZAKHSTANSKAYA PRAVDA give preference to keeping sheep, goats, horses and beef cattle on private subsidiary farms. On the specialized farms forming part of the Levoberezhnoye and Prirechenskoye associations pork accounts for two-thirds of the meat produced on private subsidiary farms.

It has long been known that any enterprise will do better if those that head it show a personal example. In Zhanasemeyskiy Rayon moral incentives are given to the managers and specialists that establish private subsidiary farms. Looking at them, others will do the same. Now every official in charge has a cow, a heifer and other animals. For example, A. L. Ruzhechko, chief economist of the Kolkhoz imeni Karl Marx, who was mentioned above, also keeps 8 to 12 geese, 15 to 18 chickens and up to 20 rabbits. The whole family together without special strain manages to care not only for the animals, but for the orchard and garden near the house as well.

The state, not only the owners of domestic animals, greatly benefits from livestock kept on private subsidiary farms. Last year, on the average, 93 kg of meat, that is, 1.5 times as much as during the previous year, and 187 eggs were procured from one rural household in the rayon. From every privately owned cow the state received 327 kg of milk and 11 kg of butter--twice as much as the average during the Ninth Five-Year Plan. Since the number of bee colonies in households more than doubled, much more honey was purchased from the population. It is characteristic that positive changes in the procurement of products from the rural population have occurred here quite rapidly.

Unfortunately, the potentials and possibilities for the development of private subsidiary farming are not utilized in the same way everywhere. For example, it is hardly possible to consider the fact that there is one cow per several rural dwellers in Kazakhstan and one sheep per two residents positive. In Kokchetavskaya Oblast at present one-fifth of the families living on sovkhozes and kolkhozes do not have any livestock. There are no objective reasons for such a situation. The farms have the necessary areas of meadows and pastures and are able to allocate the necessary amount of coarse, succulent and concentrated fodder for every rural dweller.

Our calculations and the experience of advanced farms and rayons make it possible to conclude not only on the possibility, but the need, for a significant increase in the number of livestock on the private subsidiary farms of all 19 oblasts of Kazakhstan. True, a solution of this problem is hampered by the unsatisfactory provision of fodder for the livestock of private subsidiary farms. In most of the republic's oblasts 200 g of mixed feed per sold liter of milk aregiven to the population selling the produce of private subsidiary farms to the state. People are satisfied. However, they sell not only milk, but meat as well. As a rule, incentives are not given for the sale of this product. Therefore, its greatest part "bypasses" consumer cooperatives. Furthermore, animals kept on private subsidiary farms also need coarse fodder, primarily hay. Most of the republic's farms do not cope with the solution of this acute problem. It also happens that there is a surplus of hay and straw on public farms, but managers do not respond to citizens' requests to help them to meet at least the minimal need of livestock for coarse fodder. Similar facts are noted in most of the republic's rayons.

Nor do scientific research institutes deal seriously with this problem. There is a need for efficient scientific and economic substantiations and recommendations to facilitate the management of animal husbandry on private subsidiary farms and to raise the level of its efficiency.

Unfortunately, rural dwellers everywhere are now short of the simplest farm implements. There is no small-scale mechanization equipment for the care of animals suitable for private subsidiary farms. It is advisable for workers of local industry and supply and trade organizations to more profoundly study the demand of the rural population and to see to it that the solution of this problem is accelerated.

The rise in the standard of agricultural production generated a need for an increase in the productivity of privately owned livestock and for an improvement in the quality of the produce sold by the population. Most managers and specialists believe that people will rarely keep unproductive livestock on individual farms. The logic is correct, but often practice shows the opposite. For example, in 1978 the average milk yield per cow on Kazakhstan's public farms totaled 2,070 kg and on private subsidiary farms, only 1,696 kg. The highest milk yield per cow on private subsidiary farms was in Kokchetavskaya Oblast--2,011 kg--and the lowest, in Gur'yevskaya and Mangyshlakskaya oblasts--about 700 kg. The weight requirements of the large horned cattle sold by the republic's population are 20 percent lower than of that sold by public farms. In addition to the poor provision of fodder for livestock belonging to the population, the provision of animals of breeds regionalized in a given locality was also not organized satisfactorily.

The planning of purchases of livestock products from the population also needs to be improved. As the results of an analysis have shown, in a number of rayons and oblasts in Kazakhstan an attempt is made to lower the previously attained level of procurements of livestock and poultry. For example, for 1979 plans have been made to buy from the population livestock of a total live mass of 116,200 tons, whereas, on the average, livestock of a total mass of 116,900 tons was purchased in 1976-1978. Milk purchases from the population are not planned at all, although in 1978 more than 34,000 tons of this product from privately owned cows were sold to the state. Such a careless attitude in planning to such an important potential for an increase in the production of this product can hardly be justified.

The development of amateur rabbit breeding is an important potential for an increase in the production of dietetic meat, as well as valuable fur and down. For example, amateur rabbit breeder A. Mal'tsev, who lives on the territory of the Ozerskiy Rural Soviet, breeds 18 to 21 rabbits and more per female rabbit under domestic conditions during a year. At the same time, experience shows that many amateurs are not familiar with the principles of rabbit breeding and its management techniques, especially slaughter. As a result, more than one-half of the skins received by procurement organizations do not meet the high-quality requirements and their price declines sharply. Often rabbit carcasses have a low weight, because these animals are not slaughtered at the best time. Many cases where the procurement officials themselves do not always meet rabbit breeders halfway are noted. A. Mal'tsev says that at times the sale of products is associated with such difficulties that one loses the desire to engage in this difficult, but very necessary and useful, enterprise.

In the interest of this matter the conclusion of contracts among kolkhoz members, sovkhoz workers and the administration of public farms on breeding on mutually advantageous terms poultry belonging to public production on private subsidiary

farms should also be practised. According to our calculations, the introduction of this method will make it possible to increase the total growth of meat production in the republic.

A fuller utilization of the available potentials and possibilities for increasing the production of agricultural produce on private subsidiary farms will become a significant contribution to meeting the continuously rising needs of the country's population for food products and of industry for raw materials.

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BRIEFS

PAY FOR LIVESTOCK WORKERS--"Tell us please how livestock workers are payed when the plan for production output is not fulfilled," asks N. Gontarskiy of Zhitomirskaya Oblast. Under unfavorable conditions, particulary if there is a feed shortage, the productivity of animals drops sharply and workers do not fulfill their plans for production output. In the branches of livestock raising where products are periodical or annual (in sheep raising, in fattening and pasturing livestock and poultry and others), the labor of livestock farmers is reimbursed according to piecework valuations of the volume of completed work (care of livestock) or to time worked, based on wage rates and established service norms. In this case the wage will not be lower than the established wage rate. When the product is delivered all year round(milk, meat (weight gain) etc.), labor is reimbursed according to the piecework-bonus system according to monthly results for the quality and quantity of the delivered products and for servicing livestock. If the plan in not fulfilled because of a feed shortage the size of wages for livestock farmers decreases according to the actually-delivered product. In connection with this the USSR Ministry of Agriculture in agreement with the central committee of the trade union of agricultural workers recommended to the farms of the RSFSR and the Ukrainian SSR that in the case of production necessity the existing system of wage payments for livestock farmers should be reexamined, that temporary valuations for wages to workers caring for livestock be instituted, that up to 80 percent of the 125-percent rate fund be directed for this purpose. The remainder of the rate fund should be utilized to pay workers for their products. Thus, the wage of the livestock farmers will not be lower than the wage rate. [Signed] Ye. Belogradskaya, leading economist of the Main Administration on Labor and Social Questions of the USSR Ministry of Agriculture. [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 26 Feb 80 p 4] 8228

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PROSPECTS FOR DEVELOPMENT OF NEW EQUIPMENT DURING ELEVENTH FIVE-YEAR PLAN

Moscow SEL'SKOYE KHOZYAYSTVO ROSSII in Russian No 1, Jan 81 pp 21-23

[Article by N. Nikonov, deputy chief of the Administration of New Equipment for RSFSR Goskomsel'khoztekhnika: "Equipment for the Eleventh Five-Year Plan"]

[Text] Agriculture throughout the country is becoming a highly mechanized branch as a result of implementation of the agrarian policies of the party and government. During the years of the past five-year plan alone, the kolkhozes and sovkhozes in the Russian Federation were supplied with more than 898,000 tractors, 337,000 grain harvesting combines, 674,000 trucks and many other new items of equipment, with the overall value of this equipment amounting to 12 billion rubles.

In addition to increases in quantity, qualitative changes also took place in connection with the deliveries of agricultural machines. For example, the average power rating for engines in the tractor fleet increased by 22 horsepower and the productivity of grain harvesting, silage and beet harvesting combines was raised. During the past five-year plan alone, 272 types of tractors and agricultural machines were created, 248 were made available for production operations and 300 were modernized.

During the new five-year period, the process of developing and producing equipment for the rural areas will be further accelerated. Here the principal trend will be that of completing complex mechanization in the farming and livestock husbandry branches and creating a machine system for carrying out not only the principal but also the auxiliary processes of agricultural production. The scientists and machinebuilders must solve those problems concerned with implementing basic changes in the designs for tractors, combines and other machines. The principal goal of this work will be that of raising the reliability, durability and economic efficiency of equipment units, standardization and improving the working conditions of the machine operators. An increase will take place in the production of a new generation of agricultural machines and equipment -- wide-cut and multiple-unit assemblies, pneumatic precision seed drills, low and ultra-low volume sprayers and machines for local applications of complete dosages of mineral fertilizers and complex fertilizers.

Work will be continued with regard to further raising the power capabilities of all mobile machines and new models of multiple-row combines for the harvesting of technical crops will be created. In the area of grain production, sufficient

numbers of self-propelled windrow harvesters and highly productive grain cleaning and drying stations, together with highly mechanized storehouses, will become available.

During the 1981-1985 period, the agricultural workers will receive assistance in the form of machines to be used for light mechanization and mountainous farming, for reclaiming solonets soils and for combating water and wind erosion of soils and also units for gathering up rocks and stones.

Just as in the past, the tractor will continue to be the foundation for agricultural power engineering during the new five-year plan. Design improvements will serve to raise the productivity of tractors by a factor of 1.5-1.7. This will be achieved mainly by increasing the power rating indicators. For example, the power ratings for cultivator models will be raised to 150-180 horsepower. The Minsk tractor builders will commence the production of one representative of this family of machines. This is the multipurpose MTZ-142 cultivator tractor, which has an engine power of 150 horsepower -- 2 ton-force traction class. A similar machine, the LTZ-150, is being developed at the Lipetsk Tractor Plant (see Figure 1).

The following example clearly reveals the results expected from the operation of the new models of tractors. Compared to the MTZ-82 plowing units in use today, the new machines will raise productivity to 80 percent for the principal operations. The improved design of the T-150K tractor has already proved its worth. Changes are also being introduced into many units. As a result, the power rating of the machine will be increased to 200 horsepower. The tire size will be increased and specific materials consumption will be lowered by 6.5 percent. All of these factors will make it possible to raise the productivity of the unit by 15-18 percent.

During the current five-year plan, a new 500 horsepower wheeled tractor of the 5 ton-force traction class (see Figure 2) will be placed in production. Its design will differ very little from that for tractors of the Kirovets class. However, in terms of productivity, the new addition will surpass the K-701 machine by 45 percent. In the near future, this traction class will be augmented by a caterpillar track representative. Work has already commenced on the creation of a 250 horsepower plowing unit.

At the Volgograd Tractor Plant, preparations are being made for producing the DT-75S caterpillar tractor (see Figure 3). It differs mainly in terms of its undercarriage -- hydromechanical transmission and in the engine -- gas turbine pressurized and intermediate cooling of an air charge. And all of the changes, together with the power rating of the engine being raised to 180 horsepower, will enable the DT-75S to be more than 80 percent more productive in carrying out plowing work than the previous model series.

Changes are being introduced into other machine series such as the T-130, T-150 and DT-75MK, the power ratings of which will increase respectively to 180-250, 180 and 100 horsepower. The T-150, MTZ-80M, YuMZ-6AM, T-40M and T-25M wheeled tractors will be equipped with engines having power ratings of 200, 100, 65, 50 and 30 horsepower respectively.

At the same time, fuel consumption will be reduced considerably in all of the above-mentioned tractors -- to 165-170 grams per horsepower per hour and the

pre-repair service life of the principal units raised to 8,000-10,000 hours rather than the present 5,000-6,000 hours.

A sharp increase will take place during this present five-year period in the production of machines and implements for the high-powered tractors. The principal improvements in plow construction will be aimed at increasing the number of plow bottoms. Moreover, their designs will become more diverse in nature. There will be more implements having wide-cut and cutting working organs and semi-helical and helical mouldboards. At the same time, reductions will take place in tractive resistance and metal intensiveness of the plowing units and various designs will be introduced for the hydropneumatic protection of the bottoms for work on rocky soils.

An important trend in the technical development of agriculture will be that of creating machines which carry out several operations during just one pass: pre-sowing loosening of soil, fertilizer applications and also pesticides and herbicides, sowing and subsequent packing of the soil and irrigation ridging. Such multi-purpose operations will enable the crop growers to raise labor productivity by a factor of 1.5 to 2. With the production of wide-cut sowing machines and their being equipped with improved devices for controlling the technological process, there no longer will be a requirement for auxiliary sowing personnel.

The principal trends for achieving improvements in grain harvesting equipment will include: raising the delivery capacity of the thrashers and the power ratings of the engines, increasing the capacity of the hopper, reducing the amount of time for carrying out servicing work, creating maximum conveniences for the machine operators, reducing losses and damage to the grain. At the same time, solutions will be found for such problems as raising the reliability, durability and multiple-purpose nature of the harvesting assemblies, automating the technological processes and introducing devices into operations for controlling the work of the principal organs.

Modernization of the serially produced Niva combines will raise their capability to 6.5 kilograms of grain bulk per second and for the Kolos machine -- 9 kilograms per second. The achieving of such work parameters will be promoted to a considerable degree by use of a new harvester, by intensification of the processes employed for thrashing and separating the grain bulk in an inclined compartment of the combine and by increasing the cleaning area. Beyond any doubt, this will require additional capabilities. They will be provided by the Niva 140 and the Kolos 200 horsepower engines.

At the same time, the designers are carrying out work aimed at creating a new family of grain harvesting combines. It will include self-propelled grain assemblies having capabilities up to 12 kilograms of grain bulk per second (see Figure 4) and rice harvesting combines having a similar indicator of up to 9 kilograms. These models will employ power units having power ratings of 200-250 horsepower and hoppers with capacities of up to 5-6 cubic meters.

At the same time, special equipment for harvesting the non-grain portion of a crop is being developed for these new models of harvest equipment: a hood with a windrow narrowing element, a harvester-stacker having uniform distribution of the chaff in the straw and swath formers installed along its side walls; a swath

former-mincer which makes it possible to lay the non-grain portion of a crop in windrows or spread the minced material about a field.

In the future, the non-grain portion of a crop will be harvested by pick-up attachment hay stack formers, pick-up hay balers and by roll presses of considerable capacity. As a result, the final product will be formed in stacks, bales or rolls for transporting and storage.

More productive and improved production lines having productivities of up to 100 tons per hour are being designed for the post-harvest processing of grain and seed.

The vegetable growers are being supplied with many new innovations. New and more highly productive machines are now being created for the purpose of reducing manual labor in this branch. The principal trends in such developmental work are as follows: creating wide-cut self-propelled harvesting assemblies and multi-purpose machines for use with various crops, converting the final finishing off of the products over from mobile machines to fixed sorting-finishing off assemblies.

The decree handed down by the CC CPSU and the USSR Council of Ministers entitled "Measures for Further Developing Complex Mechanization of Agricultural Production and Equipping Agriculture With Highly Productive Equipment" has become a program document for defining the tasks of the industrial enterprises with regard to the production of agricultural equipment during the 1981-1985 period. During the Eleventh Five-Year Plan, 1.87 million tractors alone, representing an overall power rating of 182 million horsepower, will be produced. Moreover, the proportion of high-powered models will be 35 percent. The realization of this program will enable the agricultural workers to solve successfully the tasks confronting them with regard to further increasing the production of agricultural goods.

More details on the new equipment recommended for production during the Eleventh Five-Year Plan will be furnished in subsequent issues of this journal.

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PROGRESS, PROBLEMS IN THE INDUSTRIALIZATION OF CROPPING TECHNIQUES

Importance of Achieving High Yields

Moscow SEL'SKAYA NOV' in Russian No 6, Jun 80 pp 4-6

[Article by N. Osychkin, agronomist: "A Field Industry"]

[Text] A notable feature of this current year for the farmers has been the extensive introduction of industrial technologies for the cultivation of many agricultural crops. The new and progressive methods are being employed in a confident manner on the corn fields and on hundreds of thousands of hectares of sunflower and soybean plantations. However, in some oblasts the initial steps have yet to be taken with regard to the use of these methods. Nevertheless, there can be no doubt but that this is a very promising trend and that it embodies great opportunities for raising labor productivity and obtaining high and stable yields.

The most strict and impartial "taskmaster" for a farmer is the harvest itself. Upon the completion of the harvest work, this journal will return to discussing the industrial technologies and it will attempt to analyze the experience accumulated, achievements realized and shortcomings noted. However, today we wish to acquaint the readers with the manner in which the new technologies are being introduced into operations out on the country's fields.

The summer of 1979. Intense hot weather prevailed in the Budzhanskaya Steppe region. The ripening corn appeared as a solid wall. Two combines, one seemingly following the other, were harvesting the weighty ears. This was the field of the mechanized detachment of Hero of Socialist Labor Savelly Mikhaylovich Parmakli in Chadyr-Lungskiy Rayon in the Moldavian SSR. From time to time, the loaded trucks could be seen departing for the threshing floor. The machine operators obtained more than 70 quintals of grain per hectare. And this was during a dry summer! Excellent yields had been obtained here in previous years.

Just what is it that allows the Moldavian farmers to obtain high and stable yields regardless of the weather conditions? "The industrial technology" categorically replied Savelly Mikhaylovich, "This represents the most reliable means for developing the production of corn. Our detachment is obtaining more and more grain while employing fewer personnel. The progressive technology has made it possible to raise the culture of farming sharply and it has served to instill strict agrotechnical discipline in each machine operator. And this is very important.

Indeed, all of the field operations being carried out under the new method have been calculated in an accurate manner, they follow one after another and they must be performed in a faultless manner."

The essence of the industrial technology consists of the complex use of modern and highly productive machines and implements, very productive varieties and hybrids, complete fertilizer norms, effective herbicides and efficient organization of labor. The farmers are released from having to carry out the traditional manual weed control work in the inter-row spacings.

In Parmakli's detachment, the cultivation of the arable land for corn commences with the disking of the fields using heavy BDT-7 harrows. Thereafter, rotary spreaders are moved out onto the fields for applying the principal fertilizer. These spreaders are inferior to a tractor having an 8-bottom plow. An assembly for levelling off the autumn plowed land completes the autumn preparation of the soil.

In the spring, the fields are given a top dressing consisting of the second half of the nitrogen fertilizer norm. The spreaders are followed by machines which apply herbicides and cover them over with soil immediately. A powerful multiple-unit assembly moves across the field leaving behind well loosened and levelled off soil. The time is now at hand for use of a 12-row precision seed drill. Hybrid seed is planted in the ground. That is it! Not another machine will enter upon this field prior to the harvest. The crop will be harvested by 6-row Khersonets-200's or by Niva grain harvesting combines with PPK-4 attachments.

Initially, this was just an experiment carried out in one detachment. Later, Savelly Mikhaylovich Parmakli's detachment became a school for leading experience, for the training of machine operator-corn growers in Chadyr-Lungskiy Rayon. Last year the new technology was employed for growing corn on the entire area devoted to this crop -- 18,000 hectares. Sixty two quintals of grain were obtained from each hectare. In those areas where the conventional method was employed, the yields did not exceed 40 quintals.

Other indicators were also impressive. Labor expenditures per quintal in Chadyr-Lungskiy Rayon amounted to 0.73 man-hours, or lower by a factor of 3.7 than the expenditures incurred when use was made of the traditional method for cultivating the crop. In the detachments headed by S.M. Parmakli, Z.S. Paskalov, N.K. Yusyumbeli and I.A. Uzun, where the yields ranged from 70 to 80 quintals per hectare, the expenditures for labor decreased to 0.35-0.41 man-hours. The industrial technology added stability to the production operations. The indicators for the detachments and farms throughout the rayon levelled off and high returns were realized from each hectare of land.

Many farms throughout the Moldavian SSR followed the fine example set by the workers in Chadyr-Lungskiy Rayon. In 1979, the industrial technology was introduced into operations on 100,000 hectares throughout the republic. An average of 50 quintals of dry corn grain was obtained from each such hectare.

Certainly, success did not come of and by itself. Similar to any new endeavor, the introduction of the industrial technology required purposeful and creative work by the republic's party organizations and agricultural organs. First of all, it was

necessary to acquaint the leaders, specialists and machine operators with the "intricacies" associated with growing corn on the basis of the new methods. An efficient wage system was developed and clear work plans composed. In the autumn, all of the fields on which corn was to be grown were assigned to detachments. The machine operators carried out the necessary work on these fields. Together with the specialists, plans for applying fertilizers and plant protective agents were prepared for each detachment. For the mechanized detachments in all areas, concrete platforms for adjusting the equipment were built, soil levelling devices were manufactured and multiple-unit assemblies were equipped with various attachments.

The corn hybrids were assigned to fields depending upon their biological characteristics, the natural fertility of the soil and the order of crop alternation in the crop rotation plans.

Concentration and interenterprise cooperation in the use of equipment have promoted the successful mastering of the new technology on large areas. Within the framework of associations for mechanization and electrification, 222 large mechanized detachments have been created. They provide services for 2-3 co-located farms. The kolkhoz fields have been enlarged and interenterprise crop rotation plans have even been formed. All of these factors have promoted increased use of the machines and improved labor productivity. Each machine operator in the detachments produced 94 tons of grain -- one and a half times more than that produced in brigades which employed the conventional technology.

The experience accumulated in the Moldavian SSR is viewed as a starting point for the mass introduction of the industrial technology into operations at kolkhozes and sovkhozes throughout the country. Two all-union seminars were held in Moldavia for the purpose of studying this progressive method for cultivating row crops. Thousands of machine operators -- in the Ukraine, north Caucasus, southern Kazakhstan and in other zones -- have mastered the expertise of obtaining high yields of corn with no expenditures of manual labor.

The readiness of the personnel and the increasing logistical potential of the kolkhozes and sovkhozes have made it possible to make the transition over from an experiment to extensive operational practice. In 1980, using industrial and improved technologies, grain corn is being grown on almost 1.5 million hectares in our country, sunflowers -- on 600,000 hectares, soybeans -- on 210,000, spinning flax -- on 53,000, sugar beets -- on 40,000, potatoes -- on 18,000, tomatoes -- on 15,000 and common onions -- on 5,000 hectares The required resources have been made available for these purposes. Today everything is dependent upon the ability and responsibility displayed by those who introduce the new technology directly into operations -- farm leaders, specialists and machine operators. This is viewed as a serious examination for the party and agricultural organs.

This year, all of the grain corn in Moldavia -- 345,000 hectares -- is being cultivated using the new technology. More organic fertilizer has been moved out onto the fields than has been the case in past years and thrifty use is being made of the mineral fertilizers. The sowing was carried out using mainly seed for simple hybrids, supplied by a local scientific-production association. It bears the same name -- Hybrid.

"The scientists and production workers of our association" stated the director of the NPO [scientific production association] S.K. Arnaut, "accomplished a great deal towards ensuring that the most productive seed can be employed together with the new technology. We built a selection-seed production complex having a hothouse and a productive and well equipped grading plant. New hybrids suitable for local conditions were created on a rather rapid basis: Moldavskiy-420MB, Moldavskiy-423, Dneprovskiy-201 and Moldavskiy-385MB. Seed production operations have been organized for the high yield hybrids Pioner 39/78 and Pioner 39/75A. A number of promising early ripening hybrids have also been prepared."

More than 500 specialized detachments were operating out on the fields during the period of spring work. They completed their sowing work in a very rapid manner. The plantations were thoroughly levelled off and the herbicides were added to the soil literally in a matter of minutes. In all areas, the seed was placed at the assigned depth -- 5-6 centimeters. In short, the Moldavian farmers are doing everything possible to ensure that the programmed yield is obtained.

The Ukrainian corn growers are confronted by complicated tasks. In recent years the areas employed for this crop have been reduced in size here and the grain yields and gross harvests have decreased. This year the republic's farmers are carrying out a complex of organizational and agrotechnical measures aimed at correcting shortcomings and increasing sharply the production of corn grain. The industrial and improved technology for growing corn provides the foundation for this work; it is being employed on more than 700,000 hectares.

It bears mentioning that this work is not being carried out in an empty area: experience in introducing new technologies has been accumulated on farms in Odesskaya, Dnepropetrovskaya, Cherkasskaya and other oblasts. Last year, more than 77 quintals of grain were obtained from each of 476 hectares at the Zaporozh'ye Kolkhoz imeni Vatutin in Vasil'yevskiy Rayon. And the team headed by Hero of Socialist Labor N.S. Lemeshko obtained 104 quintals.

The achievements of the leading workers and farms are thoroughly studied and analyzed. Training for the specialists, team leaders and machine operators was organized during the winter months. For sowing purposes, the farms laid away the required amounts of seed, fertilizer and herbicides and specialized sowing complexes were in operation in all areas. In each oblast, workers from scientific-research institutes and experimental stations were assigned to the farms. The farmers also received assistance from the collectives of industrial enterprises where needed machines and devices were manufactured. In Dnepropetrovskaya Oblast, for example, the kolkhozes and sovkhozes were supplied with rake-levelling units and combination assemblies via this method.

Special attention was given to levelling off the autumn plowed land and to employing the mineral fertilizers and herbicides in the proper manner. The specialists monitored the situation in a strict manner so as to ensure that the optimum plant density was maintained out on the fields.

High obligations were undertaken in all areas. The Zaporozh'ye kolkhozes and sovkhozes are competing to obtain 67 quintals of grain from each hectare cultivated

using the industrial method. Teams which operate on irrigated lands in Odesskaya and Krymskaya Oblasts have "taken aim" on obtaining 100 quintal yields.

Last year, serious miscalculations were tolerated on farms in the north Caucasus and Trans-Caucasus in connection with the introduction of the industrial technology and thus the corn yield per hectare was low. The proper conclusions were drawn from these mistakes. This year, an increase has taken place here in the number of farms employing progressive sowing methods. The kolkhozes and sovkhozes in the Kuban' region and Don River area have expanded their grain corn areas and intend to harvest no less than 1 million tons. The corn growers in the Kabardino-Balkarskaya ASSR are leading the competition. Here many brigades and teams plan to obtain 80-100 quintals of grain per hectare under irrigation conditions.

Deserving of special mention is the use of the industrial technology under irrigation farming conditions. Here special agricultural practices and unique methods for equipment utilization are required. Their development constitutes an urgent task confronting the scientific institutes in the southern part of the country. The farms in Kazakhstan and Central Asia have special requirements in this regard. Still another rather important problem is not altogether clear: is it possible to employ existing herbicides when growing corn in crop rotation plans which have a preponderance of cotton?

The successful experience of the corn growers has become a type of impulse which has accelerated the advance of industrial technologies onto the plantations for other agricultural crops. Among these crops, one of the first to be mentioned should be soybeans. It is no secret that a deficit of feed protein is being experienced in the livestock rations, a deficit in excess of 6 million tons for the country as a whole. Reliable methods for improving the quality of the feed include expanding the growing areas and improving the technology employed in the growing of soybeans.

In 1977, the CC CPSU and the USSR Council of Ministers adopted a decree which, in addition to the Far East, called for increases in the soybean growing areas in the southern regions of the Russian Federation, the Ukraine, Kazakhstan, Georgia, Azerbaijan and Moldavia.

Here the plans call for the specialized production of this crop, for the introduction of an efficient technology and for sharp increases in the gross yields. The fact that great reserves are available for soy bean production is borne out by the experience of leading farms, such farms for example as the Druzhba Narodov Kolkhoz in Krasnogvardeyskiy Rayon, Krymskaya Oblast, where 25-30 quintals of soybean grain are being obtained per hectare, thus eliminating the protein deficit in the feed. High results have also been achieved by the Krymsk Rossiya Kolkhoz and the Kuban' Ladozhskiy Sovkhoz.

The progressive technology for growing soybeans is based upon the use of effective herbicides, highly productive machines, production line execution of all operations in a strict sequence and the use of intensive type varieties and scientifically sound norms for mineral and bacterial fertilizers. As a rule, soybeans are grown in a crop rotation plan and on fields that are free of weeds. The principal soil cultivation system consists of shallow plowing, fertilizer applications and deep plowing. In the spring, the autumn plowed fields are levelled off and treflan and

nitran type herbicides are applied. Just as soon as the ground has warmed up somewhat, the machine operators sow their seed for regionalized varieties using the wide-row method. If the herbicides are used correctly, the plantings remain free of weeds throughout the entire growing season. They are watered several times using sprinkling machines. The harvest work commences during the phase of complete ripeness, when the moisture content of the grain is 14-16 percent.

A feature of the new technology for growing sunflowers is also that of production line execution of an entire complex of operations, the observance of the recommended alternation of crops in a crop rotation plan and the use of fertilizers and modern machines. These were precisely the factors which made it possible for the farms in Chadyr-Lungskiy Rayon in Moldavia, even during last year's drought conditions, to obtain 27.5 quintals of oil-bearing seed per hectare. The experience of the leading workers and farms is instructive: importance is attached to establishing strict control over the condition of the crops and making thorough preparations for the harvest work in the interest of avoiding losses.

Industrial technologies, whether used for the growing of corn, sunflowers, soybeans or vegetable crops, require an attentive and responsible approach in organizing the operations. In this work there are no matters of secondary concern. All operations must be carried out on schedule and in accordance with definite procedures. On each farm, importance must be attached to employing a complete complex of machines, either of foreign or domestic production, as called for in the technologies being used. In striving to create such complexes, as we have already mentioned, fine initiative has been displayed on many farms -- the production of the required machines and implements has been organized based upon use of internal resources. Beyond any doubt, this initiative must be encouraged. At the same time, enterprises of the machine-building industry must accelerate the production of new equipment that meets the requirements for the industrial technologies: machines for the preparation of herbicide solutions and for applying them, implements for tilling the soil, precision sowing drills and modernized planters, attachments for the harvesting combines and drying equipment. At the present time, insufficient effective chemical agents are being produced for combating weeds, pests and plant diseases.

A tense campaign has been launched throughout the country aimed at achieving high yields during the final year of the five-year plan. And the best tool being used in this campaign -- industrial technologies. They are laying out the future path for our farming operations.

Production Problems of New Machines

Moscow SEL'SKAYA NOV' in Russian No 12, Dec 80 p 10

[Article by D.L. Kurtsev, deputy chief of Technical Administration of Ministry of Tractor and Agricultural Machinebuilding: "A Field Industry"]

[Text] The above title, "A Field Industry," is the same as that used for the article which appeared in Issue No. 6 of our journal.

For the questions raised in that article, replies are herewith provided by the deputy chief of the Technical Administration of the Ministry of Tractor and Agricultural Machinebuilding, D.L. Kurtsev.

It is noted correctly in the article that the cultivation of agricultural crops using an industrial technology represents an important reserve for raising labor productivity and obtaining high and stable yields.

The enterprises of Minsel'khozmash [USSR Ministry of Tractor and Agricultural Machinebuilding] are supplying the equipment required for cultivating corn using an industrial technology: soil tilling machines, machines for applying mineral fertilizers, corn SUPN-8 precision seed drills, KSKU-6 corn harvesting combines, PPK-4 attachments for grain harvesting combines and others.

At the present time, the ministry has solved the problem of supplying agriculture with equipment for growing grain corn during 1981 using the industrial technology, on an area of 3 million hectares. Tasks have been established for the enterprises for producing agricultural machines during 1981.

However, it should be noted that certain difficulties are still occurring with regard to mastering the production of new machines for the cultivation of grain corn using the industrial technology, including APZh-12 units for the preparation of herbicide and toxic chemical solutions. Thus Minsel'khozmash is searching for an opportunity to substitute other machines for them on a temporary basis.

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STATUS, FURTHER PROGRESS IN MECHANIZATION OF LIVESTOCK HUSBANDRY

Moscow TEKHNIKA V SEL'SKOM KHOZYAYSTVE in Russian No 12, Dec 80 pp 20-22

[Article by V.S. Krasnov, corresponding member of VASKhNIL and Ye.A. Vagin, candidate of agricultural sciences at All-Union Scientific Research Institute of Rural Electrification: "Status and Measures for Achieving Further Progress in the Mechanization of Livestock Husbandry"]

[Text] In conformity with the decisions handed down during the March (1965) Plenum of the CC CPSU, the 23d, 24th and 25th CPSU Congresses and the July (1978) Plenum of the CC CPSU, the technical re-equipping of all agricultural branches is being carried out. Capital investments in the amount of 54.4 billion rubles were allocated for developing and strengthening the logistical base for livestock husbandry during the 1966-1975 period alone. The production of a broad range of machines, all of which conform to international standards in terms of their technical level, was mastered and considerable increases took place in the deliveries of such machines. Their number included milking units with the "yelochka" and "tandem" machines, other machines for the preparation of granulated feed, equipment for the maintenance of chickens and many other types of equipment. The overall number of technical items of equipment, employed in livestock husbandry and mastered by industry, had increased from 145 to 550 types by the beginning of 1980.

The new machines ensure the introduction of industrial methods for producing goods with minimal expenditures of labor and resources. Some of the more progressive technologies have already been introduced successfully into operations -- box maintenance of long-horned cattle, raising hogs and sheep in batteries of cages and poultry parental stock -- in cages. There are many farms throughout the country where, based upon complex mechanization, labor productivity is higher by a factor of 3-5 than the average for the country. The increase in equipment deliveries has promoted noticeable improvements in the level of mechanization of production processes on the farms (see Table).

All of these factors are promoting a certain reduction in working time expenditures: for the production of 1 ton of milk -- from 110-170 hours in 1965 to 70-90 hours in 1977, for 1 ton of weight increase in large-horned cattle -- from 550-660 to 380-560 hours, hogs -- from 340-720 to 180-340 hours, sheep -- from 460-690 to 440-570 hours, for 1 ton of wool -- from 2,120-3,250 to 2,000-2590 hours, for 1,000 eggs -- from 180-630 to 40-210 hours.

Process	Level of Mechanization (%) in					
	Cattle Husbandry		Hog Farming		Poultry Raising	
	1965	1979	1965	1979	1965	1979
Water supply	53	87	65	96	51	96
Milking	27	90	--	--	--	--
Feed supply	3	41	11	64	15	81
Removal of farmyard manure from facilities	9	72	12	84	7	84
Complex mechanization	-	39	-	62	5	70

The mentioned figures reveal that on the average the working time expenditures throughout the country for the production of livestock husbandry products are still decreasing slowly. Moreover, the overall number of service personnel has remained at practically the same level over the past 5-6 years -- roughly 5.6 million. The best indicators were achieved in poultry raising, which is more mechanized at the present time.

This testifies to the fact that there are still many unresolved problems which are restraining the required rates of growth for labor productivity. The following are mentioned as some of the principal problems: the absence of the required number of standard facilities for the maintenance of livestock, low level of power-worker ratio, insufficient production of machines and low quality manufacture for a majority of these machines, shortcomings in organizing the development and testing of new equipment and weak rates for the mastering of such equipment by industry. We will examine these problems individually. Notwithstanding the extensive construction of new farms, an acute shortage of standard facilities is still being experienced and thus many farms, even in the presence of adequate quantities of equipment, are unable to employ it efficiently.

The slow rates of growth for labor productivity are caused to a large degree by an inadequate average level for the power and electric worker ratios for the farm workers. Despite the fact that the power-worker ratio has increased by almost twofold during the past 8-10 years, its level is still insufficient for bringing about a sharp reduction in labor expenditures in the branch. Thus, on the average for the country as a whole, the established capability of all power sources per average annual livestock husbandry worker does not exceed 4 kilowatts, whereas for the complex mechanization of dairy farms and complexes of the industrial type it must be raised to 20-25 and 150-300 kilowatts respectively; for hog farming complexes -- to 55-60 and 250-300 kilowatts and for poultry raising farms and factories -- to 30-40 and 200 kilowatts.

The rates of growth for the power-worker ratio are closely associated with the rates for the construction of new and the modernization of old farms and thus they will increase accordingly to the successes achieved in this direction. It makes no sense to accelerate artificially the power-worker ratio for livestock husbandry workers if the mentioned factors are not taken into account, since in such instances the power sources made available to the farms cannot be employed in a reliable manner.

The low level of complex mechanization is associated to a considerable degree with insufficient support for the farms in terms of the required machines, many of which do not meet the modern requirements with regard to quality. Thus, owing to its low productivity and reliability, a TKS-6 conveyer should not be used in a discharge line for haylage towers, even though it was intended for this purpose. The PSK-5 feed loader is unsuitable for loading straw from ricks, although according to the technical task used in its development it was supposed to carry out this operation. The RKA-8 distributor is not suitable for the mixing of feed, that is, for the type of work that would make it most efficient. The equipment used for the primary processing and storage of milk does not meet international standards owing to the fact that aluminum and plastic were used in its manufacture instead of stainless steel. Feed distributors of the RK, RS and KSh types and also the equipment sets for hog farming complexes for 12,000, 24,000, 54,000 and 108,000 hogs annually do not meet the zootechnical requirements for dispensing dosages and are of low quality manufacture. Even in poultry raising, many items of technical equipment are inferior to similar models produced by foreign firms. For example, the KBN cage batteries, which lack built-in equipment and which are serviced from the outside, are not very efficient, since the poultry yard areas in which they are located are not utilized properly and the expenditures of working time, compared to batteries having built-in equipment, are higher by a factor of three. This also applies to the BGO-140 single-tier cage batteries used for replacement young chicken stock. The rubber parts produced for milking units are of very low quality: up to 25 percent of the nipple rubber is defective and up to 50 percent of the milk hoses are unsuitable for operation. The milking units and especially the spare parts for them are characterized by deviations from the technical conditions established for their manufacture.

The principal causes of low quality in the machines employed in livestock husbandry include: the use of poor quality materials, insufficient heat treatment for these materials, low durability of welded joints, poor quality castings and paint and varnish materials, deviations from the manufacturing tolerances, failure to carry out antiseptic measures on wooden parts and other causes.

Another factor which has delayed considerably further progress in the mechanization of animal husbandry is the unsatisfactory situation with regard to implementation of the machine system developed for the 1976-1980 period. This system, taking into account additions and refinements, includes 746 items of technical equipment, of which number 303 machines have yet to be developed, tested and introduced into production operations and 60 machines are awaiting modernization. Moreover, there were 249 new models of equipment which, at the moment that the system was approved or additions included in it prior to 1980, had still not been presented for state testing. Over the past 4 years, only those tasks concerned with the preparation of the zootechnical requirements for new or modernized items of technical equipment were carried out successfully. However, subsequent stages in the implementation of this system are being carried out very slowly. Thus, at the beginning of this year there were still 122 items of technical equipment in the active machine system for livestock husbandry which had not been presented for state testing, all of which required further development and modernization; 91 machines were undergoing state testing or had completed such testing, but were not recommended for production and there were 33 machines which although recommended had not yet been mastered by industry.

Scientific studies in livestock husbandry have been organized in a weak manner owing to the absence of the required degree of concentration and specialization in the scientific subunits. Although there are rather many such subunits throughout the country and the overall number of scientific workers assigned to them is quite large, nevertheless these subunits are unable to solve their assigned problems in a high quality manner owing to personnel dispersion and poor coordination. Despite the fact that the zoning factor does not play as great a role in livestock husbandry as it does in crop husbandry, nevertheless the work of the zonal institutes for the mechanization and electrification of agriculture and for the development of machines for livestock husbandry are organized essentially in the same manner as those for crop husbandry. In addition, a number of institutes which operate under the same natural economic conditions are developing technical items of equipment for mechanizing same process in the livestock husbandry branch and this is resulting in a dispersion of material forces and unjustified parallelism in operations. It does not come as a surprise to learn that in the development of a machine system for mechanizing the same process in livestock husbandry, many similar type machines have been proposed which differ very little from one another in terms of their principal parameters. Naturally, only a small number of these machines are selected for the system from this large nomenclature. When the work is organized in this manner, the inevitable result is that the scientific subunits accomplish very little. It turns out that science, which advocates concentration and specialization in agricultural production, is itself in extreme need of such development at the present time. This represents a large reserve for reducing scientific expenditures while simultaneously raising scientific efficiency to a considerable degree.

We believe that in order to correct existing shortcomings in the mechanization of livestock husbandry, it will be necessary first of all to create the conditions required for the complete implementation of the long-term machine system developed for the 1981-1985 and 1986-1990 periods. A great amount of assistance in this regard could be furnished by a complex plan, on the basis of which the development and implementation of a machine system by various ministries and departments would be carried out from one center.

Over the next 10 years, the mechanization of livestock husbandry must be developed in two directions -- the complex mechanization and automation of large-scale complexes with goods being produced on an industrial basis and modernization of the conventional farms of kolkhozes and sovkhozes.

For the mechanization of processes in cattle husbandry, it will be necessary to accelerate the development of highly productive automatic milking units, new and high quality equipment for the primary processing and storage of milk and sets of machines for the mechanization of operations associated with the raising of calves during the prophylactic period and replacement young stock and for the collection, processing and use of farmyard manure at large-scale complexes. In order to lower the amount of working time expended in the feeding of the livestock, raise the productivity of the feed and utilize it in a better manner, it will be necessary to organize the series production of standard shops for the production of damp mixtures, for use on dairy farms for 400, 800, 1,200, 1,600 and 2,000 cows using new equipment: DSK-30 dosing device for stalk-like feed, DC-15 dosing device for succulent feed, DK-10 hopper-dosing device, TL-65 assembled belt conveyer, TL-75-096 unloading conveyer, mixer-grinders having productivities of 4-6 and 10-15 tons per

hour, coarse feed grinders having productivities of 1-2 and 3-4 tons per hour and capable of supplying crushed feed over a distance of up to 50 meters and a set of equipment for the thermochemical processing of straw. The development and mastering of production line equipment must be accelerated for the acceptance, dosing and issuing of feed and other machines for fattening sites of the Proletarskaya type and also for sets of machines used for the raising and fattening of cattle in KRS-10 facilities. Additional studies should also be carried out in connection with the development of more efficient technical equipment and methods for mechanizing the unloading, delivery and issuing of haylage when stored in trenches, since tower storehouses, owing to their high cost and a number of other factors, do not hold much promise for the future, especially at large-scale complexes. The creation of efficient technical equipment for the mechanical removal of farmyard manure from livestock facilities must be accelerated and the construction of gravity-flow systems to be used for this purpose should be terminated as being economically unprofitable. On those farms and complexes where such systems are already in existence, it will be necessary to convert over from a natural division of the liquid manure into solid and liquid fractions to an artificial division, with subsequent sterilization of the liquid fraction.

The task of raising the technical level of hog farming operations requires the more rapid creation of sets of equipment and standard plans for feed preparation shops, for fattening farms capable of handling 12,000 and 24,000 animals at one time and for farms having a complete production cycle for 12,000 and 24,000 hogs annually, with the preparation of damp mixtures consisting of internally produced feed. A strong reserve for increasing the production of pork is that of making more extensive use of food waste products. No less than 10 million tons of such waste products can be collected annually in municipal populated points. The complete use of these waste products will make it possible to realize an annual savings of approximately 2 million tons of industrial mixed feed. It is deemed advisable to accelerate the production of an already developed complex of equipment for the processing, transporting and issuing of feed, using food waste products for 12,000 and 24,000 hogs on a one-time basis.

In order to raise the efficiency of mechanization in sheep raising operations, appropriate production capabilities must be created along with design bureaus for the production of specialized equipment; the creation and mastering of milking units and the organization, directly on the farms, of the production of cheeses and sheep cheese made from sheeps' milk; the development of a standard plan and the organization of the production of light-weight structures for prefabricated sheep-pens for zones of pasture sheep raising; organization of the production of highly productive equipment for the preparation of coarse feed for feeding purposes; the development of power engineering equipment for pastures, involving the use of solar and wind energy. During the next few years, the principal trend in the mechanization of sheep raising operations must be that of creating sets of machines and equipment for standard sheep raising farms and complexes for 2,500, 5,000 and 10,000 ewes. The artificial raising of a portion of the Romanov strain lambs will require batteries of cages with automatic lines for issuing milk substitutes and granulated feed and for removing farmyard manure and with units for illuminating the animals and regulating the microclimate in the facilities.

In order to improve the status of mechanization in poultry raising, it will be necessary to create continuous-flow automatic lines for watering, issuing of feed,

removing and processing manure, collecting and processing eggs and unloading and slaughtering broilers, based upon mainline conveyers which connect the batteries of cages of the new type and the poultry houses with the general farm installations. The long-range machine system for this branch must include new technical equipment not only for the poultry houses but also for the egg and feed storehouses, slaughtering shops and incubators. A requirement exists for new automatic batteries of cages having different design solutions: multi-stage, horizontal with two levels of the RDN-2 type and the BKI-3 cascade type for an industrial flock of chickens; the KBU-3 and BGO-2-1-40 multi-tier types for the maintenance of replacement young chicken stock; the KBB-3 triple-tier type used for the raising of broilers; the KBR-2 type for parental flocks of chickens; automatic sets of equipment for the ground maintenance of poultry and some other types.

In the sphere of mixed feed preparation and the artificial drying of feed, an acceleration must take place in the production of automatic shops and machines for the conservation of damp grain and preparing it for feeding and equipment for the preparation of dehydrated briquettes made from grasses and grain forage crops.

In the case of new construction and the modernization of old farms, a principal task is that of lowering the estimated cost of the projects by means of more advantageous space-planning solutions, the use of light-weight structures and cheap local construction materials and other measures. New construction should be carried out only on the basis of standard plans, with individual plans being curtailed or eliminated entirely. In order to determine accurately the volume of construction and also the extent of modernization of old farms, an inventory should be taken of the farms and all buildings belonging to them.

In the interest of improving the work associated with implementing a machine system for livestock husbandry, a number of measures will have to be undertaken aimed at raising the rates for the development, testing and mastering of new machines and also for the modernization and replacement of old technical items of equipment. Towards this end it will be necessary to first of all prohibit the inclusion of state testing in the plans for OKR (special design work) and to recommend the reorganization of the production of equipment not included in the machine system; to increase the production of equipment for this branch, so as to be able to satisfy substantially all of the requirements of the kolkhozes and sovkhozes. Moreover, it will be necessary to improve equipment operations on the farms and, in those areas where it is possible, to raise the coefficient of their use. This will require the development of a repair and servicing network throught the creation of modern technical service posts and stations on the farms, the assignment of the required numbers of specialists to their engineering-technical services and ensuring that the posts and stations are fully supplied with the necessary spare parts, operational materials and documentation.

In order to raise the effectiveness of scientific studies aimed at developing new equipment for livestock husbandry, it will be necessary, based upon the many small scientific subunits established at zonal institutes, to create one or two large and powerful scientific production associations for each branch. The structure of each such association should be such as to enable it to solve all tasks concerned with the development of new machines, right up until the moment they are presented for state testing. In addition to bringing about a sharp improvement in the quality of

the new equipment and reducing the amount of time required to develop it, this would also make it possible to realize a considerable reduction in the number of scientific personnel, a factor which is also of great national economic importance. In addition, the organization of large-scale scientific-production associations concerned with the mechanization of just one branch will also facilitate the creation of corresponding experimental production installations, required for the inspection and completion of the new machines and technological lines. Such experimental installations must not have firm plans for delivering livestock husbandry products to the state.

In order to strengthen further the link between science and production and introduce scientific achievements into operational practice, it will be necessary to expand in every possible way the carrying out of extensive research work, directly in response to requests by production subunits and on an economic contractual basis.

7026
CSO: 1824

SUCCESSES, PROBLEMS IN IMPLEMENTATION OF INDUSTRIAL TECHNOLOGY

Moscow ZEMLEDELIYE in Russian No 12, Dec 80 pp 2-4

[Article by G. N. Popov, chief deputy of the Main Administration of Agricultural Science and Propaganda of the USSR Ministry of Agriculture]

> [Text] From a draft of the CPSU Central Committee to the 26th Party Congress "Main trends of economic and social development of the USSR for 1981-1985 and for the period up to 1990." Accelerate conversion of agricultural production to an industrial base and progressive techniques.

During the past few years the level of mechanization of agricultural production in our country was elevated and the rates of converting agriculture and animal husbandry to an industrial base were accelerated significantly. During four years of the 10th Five-Year Plan, energy capacities in agriculture were increased by 20 percent and reached 236 horsepower per 100 hectares of plantings of agricultural crops.

Conversion of agriculture to an industrial basis is a new important step for development of the sector having great prospects. It will contribute to implementation of the most important task advanced in the draft "Main trends of economic and social development of the USSR for 1981-1985 and for the period up to 1990" on extensive transformations in the most important sphere of human activity--in labor, improvement and easing of working conditions, on providing wide opportunities for highly productive and creative work, on elimination of the significant differences between mental and physical labor and on transformation of agrarian labor to the variety of industrial labor. Acceleration of conversion of agricultural production to an industrial basis provided for the near future will contribute to implementation of the food program now being worked out.

Technical re-equipping of agriculture is accompanied by improvement of the techniques, organization of labor and control of production, more extensive specialization of it and intensification of concentration. All this required that agricultural science organize development of complex recommendations for production. Among them, recommendations on industrial techniques for cultivation of agricultural crops are of especially important significance. These recommendations were developed and began to be introduced in cultivation of corn, sugar beets, potatoes, sunflowers, soybeans, fiber flax and vegetable crops.

The fact that further introduction of industrial techniques in agriculture was provided in the draft of "Main trends of economic and social development of the USSR for 1981-1985 and for the period up to 1990," complete complex mechanization of sugar beet, raw cotton and fiber flax production during the 11th Five-Year Plan, application of organic and mineral fertilizers to the soil and utilization of means of plan protection and a significant increase in the level of mechanization of vegetable, potato, fruit and fodder production evoke great satisfaction.

Solution of the problem advanced in the draft of the "Main trends on implementation of a purposeful complex program to reduce the use of manual labor" is of enormous significance in this regard.

The main distinctive features of industrial techniques are complex mechanization of all production processes--the use of highly effective means of chemization, new intensive varieties and hybrids adapted to mechanized cultivation and harvesting and scientifically based agrotechnics designed to produce high planned yields.

The use of industrial techniques provides an enormous economic effect--it increases labor productivity, reduces product cost and provides an increase in the yield of agricultural crops.

The agricultural workers of the Chadyr-Lunskiy Rayon, Moldavian SSR, were innovators of wide-scale introduction of industrial techniques. In 1977 a mechanized corn-growing detachment headed by Hero of Socialist Labor S. M. Parmakli was the first to use such a technique of corn production on an area of 800 ha and achieved a yield of approximately 60 qt/ha, having expended 0.35 man-days per quintal of grain. A school of advanced experience was created on the basis of this detachment. The next year all corn growers of the rayon assimilated the new technique of corn cultivation and grew a grain crop of more than 60 qt/ha on an area of 18,000 ha. Labor expenditures per quintal in this case compared to the previous technique were reduced by a factor of 4 (from 3.2 to 0.7 man-days). Corn growers from many rayons of Moldavia, the Ukraine, Russia, Kazakhstan and other republics followed the example of the workers of Chadyr-Lunskiy Rayon. For example, more than 220 corn-growing mechanized detachments operated by the industrial technique in 1979 in the Moldavian SSR. Throughout the country as a whole it was used on 160,000 ha of corn plantings and in 1980 it was 1,140,000 ha. The detachment of S. M. Parmakli produced 71 qt/ha of corn in 1978 and 72 qt/ha in 1979; even in 1980, unfavorable in weather conditions, 70.2 qt/ha of corn were harvested.

The farms of Bolgardskiy Rayon, Odesskaya Oblast, which cultivated 50 qt/ha of corn on an area of 4,200 ha in 1979 and 48 qt/ha on 7,000 ha in 1980, achieved great successes. During this year the kolkhozes and sovkhozes of Shovgenovskiy Rayon, Adygeyskaya Autonomous Oblast, using an industrial technique, harvested an average of 57 qt/ha of corn, while the Kolkhoz imeni 22nd Party Congress harvested 67.3 qt/ha. The average corn yield was 40.4 qt/ha in the Georgian SSR where the new technique was introduced, while only 23 qt/ha was harvested by the ordinary techniques.

The industrial technique of sugar beet cultivation and harvesting has been introduced successfully in the country. In 1980 more than 200 farms of the RSFSR, the Ukraine and Moldavia used it on an area of more than 64,000 ha. The yield of root crops is usually significantly higher on them than on other kolkhozes and sovkhozes

with a reduction of specific labor expenditures by a factor of 1.5-2. The example of the work of sugar beet growers of Mogilev-Podol'skiy Rayon, Vinnitskaya Oblast, is typical. During the period 1976-1979, they achieved high indicators--the average yield of root crops comprised 337 qt/ha while labor expenditures comprised 511 man-days per hectare. In 1980, with total assimilation of the industrial technique, the sugar beet harvest was increased to 352 qt/ha while labor expenditures were reduced to 180 man-days per hectare. Even higher labor productivity (100 man-days/ha) was achieved this year by the sugar beet growers of Rybnitskiy Rayon, Moldavian SSR with a yield of 374 qt/ha of root crops.

The farms of Likhoslavl'skiy Rayon, Kalininskaya Oblast, displayed a valuable initiative in conversion of fiber flax cultivation to an industrial basis. In 1979 they grew flax on an area of 5,300 ha by the new technique, which provided a 1.5-fold increase in the yield of this crop compared to the level during the previous three years. In 1980 200 farms of Russia and Belorussia introduced the industrial technique of fiber flax cultivation on an area of 53,000 ha. Despite unfavorable weather conditions, they achieved a yield of fiber 2-3 qt/ha higher than other farms.

Industrial techniques were also applied successfully to cultivation of potatoes [illegible] ha), sunflowers (620,000 ha), soybeans (220,500 ha), tomatoes (15,000 ha), [illegible]on onions (5,000 ha) and other crops.

Scientists, primarily of All-Union scientific research institutes of corn, sugar beets, oil-seed crops, soybeans, the Scientific Research Institute of Vegetable Farming, the Scientific Research Institute of Potatoes, many zonal scientific research institutes of agriculture, selection centers and experiment stations are making an important contribution to development and assimilation of new techniques of agricultural crop cultivation. Party, Soviet and agricultural bodies are participating actively in organizing their introduction.

Assimilation of industrial techniques in agriculture is a complex matter since it has an effect only with complex introduction of all their elements. If just one requirement is unfulfilled the results of the entire matter drop sharply. Therefore, successful extensive use of industrial techniques is possible only with clear organization of work, a complex approach and a combination of the efforts of farms, scientific research institutions, organizations and enterprises which servi service agriculture and which are linked to them by unified production goals. Experience shows that this approach yields the best results. For example, introduction of industrial techniques in Slobodzeyskiy Rayon, Moldavian SSR, where this work is being carried out in a planned and coordinated manner, has been well organized. Here the party raykom and rayispolkom have created a special staff for assimilation of industrial techniques which coordinates and monitors the activity of all links of this complex unit. It follows the preparation of scientific recommendations, provision of farms with a complete set of equipment and other facilities, training of personnel and so on.

The close ties of the rayon to the scientific-production associations created in the republic contribute to success of the matter. Thus, introduction of the industrial technique of tomato cultivation and improvement of it have been implemented in the rayon with the creative cooperation of farm workers with the collective of the NPO [Scientific-production association] Dnestr, the staff of which includes

the Moldavian Scientific Research Institute of Irrigated Agriculture and Vegetable Growing. Extensive introduction of the industrial technique of tomato cultivation became possible only after the selection specialists of the institute developed special varieties (Kolokol'chik, Fakel, Nistru and Raduga) which have valuable properties (simultaneous ripening and tolerance to mechanical cultivation), while the engineers improved the machine system. The effectiveness of the industrial technique was increased significantly by application of fertilizers at rates calculated for the planned yield from data of soil examination and uptake of nutrients. The use of the industrial technique of tomato cultivation required that both measures to improve organization of state procurement and the technology of product processing be implemented in the rayon. Specifically, the productivity of primary tomato processing stations on the farms was increased, container shipment was introduced and so on.

The most complex matter on a country-wide scale in introduction of industrial techniques in agriculture is provision of the farms with a complete set of the appropriate material and technical equipment. The USSR Ministry of Agriculture and Goskomsel'khoztekhnika established the order for supply of farms with this equipment and incomplete deliveries of them. Unfortunately, this procedure is not being observed strictly everywhere, which led to additional difficulties in introduction of industrial techniques. Of course, these difficulties are related to a known degree to the shortage of some machinery and some types of herbicides, fertilizers and seeds of intensive type varieties and hybrids. But overcoming these difficulties requires not only a significant improvement in the work of agricultural machine-building systems and the chemical industry and improvement in the planning of material and technical support of agriculture, but also a significant increase in the efficiency of utilizing material resources on kolkhozes and sovkhozes and a more thrifty attitude toward equipment, fertilizers and herbicides. The latter depends to an enormous degree on improving the work of agronomists, engineers and other specialists of kolkhozes, sovkhozes and agricultural bodies. There are facts on some farms when new equipment designed for introduction of industrial techniques is utilized inefficiently.

The main condition for highly efficient use of material and technical facilities is training and education of skilled machine operator personnel on kolkhozes and sovkhozes and in improvement of the masters of equipment who have an extensive knowledge of the new techniques. The ministries of agriculture of the USSR and the union republics are conducting extensive organizing work in this direction. It is important that the available opportunities be more fully utilized locally to increase the quality of personnel training and that scientists, highly qualified specialists and leading machine operators be recruited more extensively for this.

The corresponding subdivisions of the USSR Ministry of Agriculture and of a number of union republics have developed operating programs for each crop in which specific deadlines for implementation of this matter by objects have been determined, the workers responsible for fulfillment of the measures have been named and scientific research institutions have been attached to farms for further improvement of work to introduce industrial techniques in agriculture. It is necessary that these programs achieve more specific embodiment in the plans of local agricultural bodies, kolkhozes, sovkhozes and scientific research institutions.

Our scientists have an important duty to the agricultural workers assimilating the new techniques. More effective varieties and hybrids of agricultural crops adapted to industrial methods of cultivation and which have a short vegetation period and high resistance to diseases and pests are acutely required for production. Industrial techniques and machine systems require further improvement. There are significant complaints against machine builders. There is still a shortage of many reliable and productive machines in the sets of equipment for cultivation of onions, sugar beets, corn, potatoes and other crops.

Measures are now being implemented to improve the work of agricultural science. Programs for creation of new varieties and hybrids suitable for industrial techniques of cultivation have been developed and have already been implemented at selection centers.

The USSR Ministry of Agriculture and VASKhNIL [All-Union Academy of Agricultural Sciences imeni V. I. Lenin] have provided a number of purposeful complex programs in the scientific research plans for the new five-year plan, implementation of which will permit more successful improvement of technology in agriculture.

6521
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TILLING AND CROPPING TECHNOLOGY

SPRING FIELD PREPARATIONS IN ALTAYSKIY KRAY REPORTED

Moscow SEL'SKAYA ZHIZN' in Russian 31 Dec 80 p 1

[Article by A. Torichko: "The Gold Fund of the Harvest"]

[Text] The Altay lowland is resting under a snow cover. Snowdrifts are growing in the steppe village and near the protective belts of forest strips. "The more snow, the more grain!" say the agricultural workers, daily sending out hundreds of tractors for snow retention. The roar of motors and the clanking of metal do not stop in the repair shops from morning to late evening. Work is also under way with seed--the basis of the yield of the first year of the 11th Five-Year Plan.

Most farms of the kray began to prepare them as early as spring. They placed the seed plots on the best lands for good precursors and harvested the seed on time and immediately sent it to the corn cribs for filling. The warm, dry fall contributed to premature ripening of the grain and to an increase of germination. When the time for frosts and snow storms arrived, three-fourths of the seed material of grain, legume and groats crops had been brought up to high planting conditions. And by the end of December more than 95 percent of conditioned seed, the greater part of which meets requirements of first and second class, was already present in the kray.

The managers and specialists of Zav'yalovskiy, Kulundinskiy, Shipunovskiy, Klyuchevskiy, Blagoveshchenskiy and a number of other rayons treated the "gold fund" of the harvest in a businesslike manner, where from 55 to 82 percent of the filled seeds are related to first class and the remaining percent is related to second class. Fifteen rayons have 90 percent and 10 rayons have 100 percent of seed of only first and second class of planting standard in the entire kray.

This indicator has now been achieved for the first time by the grain growers of Zalesovskiy Rayon, located in the foothills of the Salair. They referred primarily here to the soil-climatic features and early fall frosts which would not permit cultivation of fully ripe seeds. Not only did they grow them, but they covered the entire spring crop section with only first and second class.

The "secret" is simple: the party, Soviet and economic bodies of the rayon sharply changed their attitude toward work with seeds and organized control and established a strict accounting from managers and specialists for the quality of the seed material. Moreover, the position of agronomist-seed specialist was introduced on the staff of each farm. And there are essentially no unconditioned seeds! Reproduction

was increased and the variety composition was improved. Planting areas of promising varieties of wheat such as Novosibirskaya-67 and Luganskaya-4 will be expanded on many farms.

"Luganskaya-4 is especially suitable for us," emphasizes the head of the regional control seed laboratory Yu. P. Klimakov. "Ours is a taiga zone. The snow arrives later and sowing is maintained for a minimum of a week. But the Luganskaya variety ripens earlier and is not subjected to fall frosts. It yielded seven quintals of grain more than the average rayon yield per hectare on the sovkhoz Bol'shevik."

Excellent oats, pea, buckwheat and flax seed are now stored in the bins along with the main food crop. The reserves of them permit a 20 percent increase of oats planting of the Narymskiy variety next spring, which has a higher yield under local conditions than the traditional Astor variety. Shatilovskava buckwheat will be completely replaced by Kalininskaya, each hectare of which now yielded nine quintals more of grain. The planting area of peas will be increased by 500 hectares.

The kray's largest flax-sowing rayon has prepared a strong base for cultivation of Belgunets variety. A total of 20-25 quintals of straw and 3-3.5 quintals of seed per hectare was harvested from 2,000 hectares. And the leading brigade of the sovkhoz Truzhenik, headed by I. V. Loginov, harvested more than 35 quintals of straw and 4 quintals of flax seed of the Tomskiy-10 variety per hectare from 130 hectares. The entire planting area of a valuable commercial crop will be sown with seeds only of this variety during the first year of the 11th Five-Year Plan and it will mainly be of first and second reproductions. The germination of this seed already exceeds 90 percent.

"I tentatively followed the course of the All-Union Agronomical Conference," says the chief agronomist of sovkhoz Zalesovskiy V. N. Dorovskikh. "The problems which were discussed there have long been awaiting a solution. One of them is an increase of seed quality. We are successfully solving it: all seeds have been brought up to high conditions."

"But this has not been easy. The farm has five obsolescent mechanized threshing floors. Many assemblies, especially the seed separator units, have worn out and failed. No equipment is coming in for them. To produce seed of second class, the grain must be passed through the cleaning machines up to three times. This requires both additional time and excessive expenditures. But the main thing is the embryo is damaged and the germination of the seeds is reduced."

Incidentally, what is second class? These are seeds with which up to 5,000 weed seeds per hectare are sown in the soil at the same time. And the figure is 35,000 with third class. It would seem that only first class seeds are needed. How does one produce them? In the taiga zone where hundreds of small agricultural plots are surrounded by forest, it is sometimes impossible to use herbicides. Years are required to control weed vegetation in a fallow field. The main method remains mechanized processing of the seeds. But there is insufficient equipment. It is important to provide the kolkhozes and sovkhozes with modern, highly productive grain-cleaning equipment.

This problem requires solution also because the difficulties stimulate one not only to a creative search for an exit from the developed situation but it also becomes a unique shield for some managers and specialists which covers up their own negligence. Whereas the base of the future harvest is being generally prepared in a thrifty manner throughout the kray as a whole, there is from 13 to 18 percent of unconditioned seeds in weediness in Krasnogorskiy, Novichikhinskiy, Bystroistokskiy and Soltikhinskiy Rayons. And the agronomic service is primarily responsible for this.

REPORT FROM FERTILIZER, FERTILITY CONFERENCE IN MINSK

Minsk SEL'SKAYA GAZETA in Russian 21 Nov 80 p 3

[Article: "Reserves Are the Tool of Fertility"]

[Text] The work of the All-Union Seminar-Conference on Agrochemistry with the participation of responsible party, Soviet and economic workers of the republic, krays and oblasts was completed on 20 November in Minsk. An exhaustive analysis of the production and scientific activity of Sel'khozkhimii [expansion unknown] during the year that has passed after creation of this unified specialized service was made and ways of increasing the effectiveness of chemization of agriculture were noted in light of the decisions of the July (1978) and October (1980) Plenary Sessions of the CPSU Central Committee.

Subdivisions of Sel'khozkhimii are now performing through their own efforts all work on production of local lime and gypsum-containing materials, are liming and applying gypsum to the soils, are extracting a large part of peat for fertilization, are transporting approximately half of organic fertilizers to the fields, are introducing one-fourth of all fertilizers to the soil and are implementing measures to protect plants against pests and diseases.

The Belorussian, Latvian and Moldavian Associations of Sel'khozkhimiya have been conducting a great deal of purposeful work to increase soil fertility since the first day of its activity. Under the complex conditions of the current year, the collectives of these associations were able to give a good account of themselves as active and viable organizations which have great prospects for development.

Regional and interregional associations of many oblasts of the Russian federation, the Ukraine, Turkmenistan and the Kirghiz SSR have begun work in an organized manner. For example, an additional 30 detachments for peat procurement were organized this year in Volynskaya Oblast, more than 10 limestone quarries were opened and work is being carried out to strengthen the material and technical base of regional associations. If one takes into account that the degree of chemization in formation of the crop is equal to 50-60 percent and the average annual increase of yield in 1976-1979 comprised 31.7 and 5.1 million tons, respectively, for grain and cotton--considerably higher than past years, then the ever-increasing role of the agrochemical service becomes understandable.

"Analysis of the effectiveness of fertilizer application throughout the country as a whole shows that fertilizers produce a stable increase of yield and this work

is being improved constantly," said correspondent of BELTA [Belorussian News Agency], Chairman of the Soyuzsel'khozkhimiya Association, Deputy Minister of Agriculture of the USSR V. P. Nikonov. "However, the period of organization and establishment of associations has not yet been completed in some republics, krays and oblasts. For example, the agrochemical service is being poorly organized in the Armenian SSR and the managers of the Uzbek Sel'khozkhimiya, whose activity has been reduced to working on plant production and supply with chemical products, show insufficient initiative. Dispersion in the activities of individual subdivisions is observed in most associations but the economic relations with kolkhozes and sovkhozes have not been finally worked out and other important problems have not been resolved, which in the final analysis maintains the rates of production. For example, many million tons of grain were lost this year due to extensive lodging of grain, while a considerable quantity of TUR and camposan preparations capable of forming a stronger stalk remained in warehouses without application. The corn on many farms of the Nonchernozem Zone of the Russian Federation, the Ukraine and Belorussia was sown with hydrophobized seed, which makes it possible to carry out sowing earlier than usual and as a result a good yield of this crop was achieved on an area of 420,000 hectares. Undoubtedly this method of treating seed needs wide distribution.

Many of those giving talks at the seminar appealed to the Ministry of Tractor and Agricultural Machine Building of the USSR with a request to accelerate output and delivery of a complex of highly productive machines for application of organic and mineral fertilizers and for protection of plants from diseases and pests and other equipment and also the Ministry of Mineral Fertilizers of the USSR to increase the amount and to sharply increase the quality of mineral fertilizers and other means of chemization.

The agrochemical service of agriculture has been under development in our country for many years and specific experience has been accumulated during this time. It found its fruition in the recommendations worked out at the forum of chemical-agrarian specialists.

The Deputy Chief of the Agricultural Department of the CPSU Central Committee I. K. Kapustyan summarized the results.

Candidate for membership of the Politbyuro of the CPSU Central Committee, First Secretary of the Central Committee of the Belorussian Communist Party T. Ya. Kiselev, Chairman of the BSSR Council of Ministers A. N. Aksenov and Secretary of the Central Committe of the Belorussian Communist Party N. I. Dementey participated in the work of the seminar-conference.

4321
CSO: 1824

USE, APPLICATION OF FERTILIZERS WITH AN EYE TO MOLDAVIAN CONDITIONS URGED

Kishinev SOVETSKAYA MOLDAVIYA in Russian 4 Jan 81 p 2

[Article by M. Tsurkan, head of laboratory of the Moldavian Scientific Research Institute of Soil Science and Agrochemistry imeni N. A. Dimo, candidate of agricultural sciences: "Use Fertilizers Efficiently"]

[Text] The grain growers of our republic achieve rather high yields of winter wheat from year to year. These are the fruits of the industrial technology of growing it, introduction of intensive varieties and also extensive use of local and mineral fertilizers. A total of 200-210 kilograms of nutrients from mineral fertilizers alone are applied per hectare to this crop annually. During the 11th Five-Year Plan, the doses of mineral fertilizers per hectare of wheat will be brought up to 250-260 kilograms of nutrients, which should contribute not only to a further increase of the grain yield but also to appreciable improvement of its quality.

However, one must talk sadly about the fact that the achieved increases of yield and especially grain quality still do not correspond to the constantly increasing doses of applied fertilizers. Moreover, even with foliar nitrogen application of urea and treatment of plots with TUR preparation, grain quality remains below the standard. Only 30-35 quintals of grain of poor quality is frequently harvested on full-grown and heavy seedings. Thus, during 1974-1978 a biomass of winter wheat was cultivated on some farms of Rybnitskiy and Ogreyevskiy Rayons which should form a grain yield in the range of 67-70 quintals per hectare according to calculations. In fact, only 30-40 quintals were harvested. The protein content in the grain did not exceed 12-13 percent and the gluten content did not exdeed 22-24 percent. The reasons which led to a shortfall of yield and poor quality are many: disruption of the planting deadlines and poor cultivation of the sowings, unskillful use of fertilizers and so on.

The largest amount of mineral fertilizers for various agricultural crops and also for root and foliar top-dressing of winter wheat has essentially been accumulated on the farms during periods from completion of fall and prior to the beginning of spring field operations. And it is during this time that there is a sufficient quantity of free equipment and transport facilities and the agricultural aviation is least loaded, the workers of which apply fall-winter and then early spring (on frozen - thawed soil) nitrogen top-dressings to wheat. And they are also sent to transport mineral fertilizers to the plantings. Moreover, fertilizers are applied in amounts insufficient for sugar beets and corn. The high rates of fertilizer application turn against both winter crops and against the natural environment.

Plantings fertilized early and abundantly with nitrogen prior to the onset of winter grow too much and many unproductive stalks and a large vegetative mass form in spring. Internode shooting of the stalk lengthens significantly on these plantings and it thus loses resistance to lodging. Due to the unproductive bushiness, dense plantings are poorly ventilated and are weakly subjected to insolation, becoming a favorable medium for development of various diseases of Fusarium, powdery mildew, rust and so on. Plants are infested to a greater degree of aphids and bugs, are subjected to the maximum to air drought and the grain is puny with low protein and raw gluten content.

It should be noted that weak plantings of winter crops is primarily the result of poor soil preparation and a late sowing deadline. In these cases the role of fertilizers is reduced only to accelerating the rates of passing through the development phases and growth of plants rather than to increasing the .

Fall-winter top dressings under conditions of complex relief lead to high losses of nitrogen, it is carried off by rains and thaw water and a considerable part of the nitrates is washed down the slopes in dry weather. Therefore, even if high doses of fertilizers are applied, winter wheat experiences an appreciable nitrogen deficiency during grain forming and the water resources become unsuitable for man and animals.

Thus, unskillful use of nitrogen fertilizers leads to a significant shortfall in yield and to a reduction of quality and as a result to excessive expenditures funds and to environmental pollution.

A scientifically based system of fertilizer application to winter wheat envisions complete support of the plants from fall (for the main treatment of the soil) with phosphorus (60-90 kilograms depending on the soil), potassium (60 kilograms) and with nitrogen in stages. That is, it is recommended that no more than 40 percent (60-75 kilograms) of nitrogen fertilizers be applied to plowed soil in the fall and the same amount in the spring (during the beginning of spring vegetation of plants) for root application and 20 percent for foliar application. It is feasible to carry out two root applications of nitrogen in the spring on weak plantings of winter crops. They should be carried out on the same plots where winter crops emerged from wintering-over in a very good condition. In this case one can limit oneself only to a single top dressing and smaller dose. Step-by-step supply of winter wheat with nitrogen permits regulation of the nitrogen nutrition of plants and creates a strong stalk, greater resistance to infection with diseases and infestation by pests and to an intensified supply of the plants with nitrogen during grain forming.

It is time to eradicate the practice of nitrogen top-dressing on frozen-thawed soil, which is not justified under conditions of our republic, and to restore in the proper order spring harrowing of well-developed winter crops. The established rates of application, ratios and deadlines for application of fertilizers to all agricultural crops must be strictly observed to provide high effectiveness of means of chemization in agriculture.

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ADVANTAGES OF LAYERED PLOWING OF SUGAR BEET AREAS DISCUSSED

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[Text] Sugar beets place high demands on the quality of basic soil cultivation. However, when general-purpose plows are used for plowing for this crop, good fall plowing is not always achieved. Many plant residues remain after two-phase harvesting of winter wheat, they frequently clog the plow and this leads to a decrease of the depth of plowing. Moreover, ordinary moldboard plows poorly turn the furrow, especially with great depth of plowing, and part of the stubble remains in the upper layer and even on the surface of the soil. This makes pre-planting preparation of the soil for sugar beets difficult, reduces the quality of sowing and complicates cultivation of the plantings. And also there is uniform distribution of scattered weed seeds over the entire plowed layer when plowing with ordinary plows, as a result of which the potential weediness of the upper level of soil is increased. Elimination of these deficiencies while retaining all positive aspects of plowing would be of important production significance.

Layered or multistage plowing of the soil is of undoubted interest in this respect. From 1975 through 1977, plowing for sugar beets was carried out by a PYa-3-35 two-stage plow at the All-Russian Scientific Research Institute of Sugar Beets and Sugar Crops. Its essential difference from ordinary plows is that a second base which completely removes the upper 10-15 centimeter layer of soil, turns it and throws it into the furrow opened by the previous pass of the unit, has been installed instead of a skim coulter. It is regulated the same as the skim coulter in the depth of plowing. A lower, main base is located behind the upper base. It cuts the underlying furrow of soil, raises it and places it on the first layer. In other words, the soil levels change places without being mixed.

The semihelical moldboards of the two-stage plow and also the distance between the lower (main) bases increased by 150 millimeters contribute to better crumbling and turning of the furrow and total, deeper processing of the after-harvest residues and fertilizers and provide stable operation of the plow (it is essentially not clogged up).

Two schemes of layered plowing were studied in our experiments: 10 + 20 and 15 + + 15 centimeters with a total depth of plowing the soil of 30-32 centimeters. Plowing was preceded by various methods of scuffling: by disc or share implements and by a heavy disc harrow with cutting discs. The experimental program provided for determining the effect of layered plowing on the weediness of sugar beet

plantings and the water-physical properties of the soil. Moreover, the operation of the plow by the degree of covering plant residues, the uniformity of plowing in depth and the resistance of the plow to clogging with straw was evaluated.

During the years the experiments were conducted, the height and mass of the stubble were different. Its height was 18-23 centimeters and mass was 10-12.5 quintals per hectare in 1975-1976. In this regard 1974 was unique, when the average height of the stubble reached 38 centimeters and 45 centimeters or more on some microdepressions of relief. A total of 25.4 quintals of straw remained in the form of stubble on a hectare of harvested area. But even under these conditions, the two-stage plow operated reliably and no cases of its clogging were noted. After plowing, the soil surface was completely free of after-harvest residues and the main mass of stubble was covered in the lower levels of the soil. Its content was insignificant--4.8 percent on the average during the years of investigations in the upper layer (0-10 cm). And 35.7 percent of the stubble was in the upper layer of soil, while 7.4 percent remained on the surface when the soil was plowed with a PN-4-35 skim-coulter plow.

But the main advantage of layered plowing is that the total weediness of the sugar beet plantings was reduced significantly after plowing. The number of vegetating weeds was reduced by a factor of 1.3-1.7 and during some years it was reduced by one-half by the beginning of formation of dense plantings. This was retained primarily until the end of vegetation. The mass of raw weeds on sections with layered plowing was less by a factor of 2.5-7 prior to harvesting the sugar beet crop than after ordinary plowing.

The system of main cultivation of the soil with layered plowing may be equivalent to improved fall plowing, which is a powerful means of weed control in our zone, which has been widely distributed and generally recognized. Moreover, layered plowing under our conditions had a positive effect on the water-physical properties of the soil. Thus, the productive moisture reserve on sections plowed with a two-stage plow was higher at the beginning of sugar beet vegetation than with ordinary plowing. This is obviously related to the higher level of water permeability of the soil on those sections during the early spring period.

Layered plowing reduced the volumetric mass of soil by 0.1-0.15 gram per cubic centimeter by enriching the upper level of the plowed layer with water-stable structural units. This positive property was retained throughout the entire vegetation period since better-structured soil was packed less due to the effect of precipitation and agricultural machinery. However, a two-stage plow raises the lower, less active layer of soil to the surface, which is inferior to the upper level in the level of effective fertility. How is this shifting of the soil levels reflected in the biological activity of the soil and in the final analysis on the productivity of sugar beets?

Study of these problems was also provided by the program of our investigations. The intensity of biological processes in the plowed layer of soil was determined by the rate of carbon dioxide release. The results indicate that two-layered plowing immediately after sowing reduces the biological activity of this layer of soil, especially of its upper part. But by the time of intensive growth of the leaf apparatus, the soil microflora significantly increased its activity. The release of carbon dioxide was 9.3-21 percent higher than on sections plowed by

the improved fall plowing method. This was primarily retained until the beginning of harvest, which had a decisive effect on formation of the sugar beet yield. The gross harvest of tubers per hectare exceeded control indicators by 14-29 quintals in the best versions of layered plowing. The most acceptable scheme of plowing was 15 + 15 centimeters in combination with scuffling with discs and plowshares. Plowing by the scheme of 10 + 20 centimeters was somewhat worse. The production experiment conducted in 1978 on fields of the experimental farm of the All-Russian Scientific Research Institute of Sugar Beets and Sugar Crops confirmed the results of our investigations. The weediness of the plantings prior to formation of plant density with layered plowing was reduced by a factor of 1.8 compared to improved fall plowing, which made it possible to reduce by one-third expenditures of manual labor on weed control in the beet rows. The yield of tubers with layered plowing comprised 313 quintals per hectare, 23 quintals greater than the control indicator.

Thus, two-layer plowing in the system of main cultivation of the soil for sugar beets is a progressive procedure. It significantly reduces the total weediness of the sugar beet plantings without additional expenditures on weed control. A multistage plow completely covers plant residues in the soil, which guarantees high quality of pre-planting soil preparation, sowing and cultivation of the plantings. Favorable conditions are created for growth of sugar beets, the water and air conditions of the soil are improved, the density is reduced and as a result the productivity of the sugar beet field increases. All this provides the basis to recommend layered plowing (15 + 15 cm) for extensive use under production conditions on chernozem soils of our zone.

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